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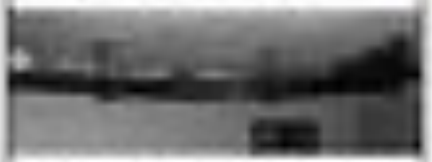

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CONTINENTAL
MODELLER

Contents

Big numbers for our hobby

Want to buy model railroad hobby during? Pretty good, judging by recent statistics taken from the new and improved ModelRailroader.com website.

If you haven't visited our website in a while, take a look. Subscribers can watch our exclusive workshop webcasts. Browse and make copies of more than 500 track plans to our searchable database, and read guidance reviews of software.

Even if you buy only occasional issues of *Model Railroader*, you'll have access to weekly hobby product announcements and many of the articles we've linked to the contents of each issue.

Plus members can also edit their bookmarks in the handy and helpful Model Railroader Kalendar.

Since Model Railroader's new website went live last fall, more than 1,000,000 visits have been recorded, as almost 10,000 of you visited the site for the month or more it's been online. Visitors have looked at a total of 1,329,297 pages of information within the website.

Model Railroader's weekly e-mail newsletter has 168,757 subscribers. Adding in the largest and most recent digital issues of hobby publications, it totals 300,000 users. If you don't already get this newsletter, go to ModelRailroader.com to sign up. It's free.

But we're not the only ones who have had a good return visitors.

More than 448,000 people attended World's Greatest Hobby on four dates this past season. The shows produce the hobby of model railroading and we look at large train club shows. There were four dates this past season, which means an average of about 77,000 people attended each show.

Back in January, the Amherst Railway Society show in Springfield, Mass., saw 21,124 people pass through its doors for a total attendance number of 21,772. In suburban Milwaukee in November, Trainfest attracted 21,027 attendees.

On the next time a train hobby expo is looking ahead about the start of model railroading, start rattling off some of these numbers.

Outside Allen recently's house was 3 that impressive used train on Administration. Another one here, who usually a photographing layouts for *Model Railroader*, offers this recipe for weathering track starting on page 34. Color photographs can be seen at the website (and about Model Railroad logging issues starting on page 44).

Most hardly another regular contributor explains on page 50 how he carried spray foam on under wood used to make a chalk trimmer he'll be easy to build railroad for his HO scale layout.

And on page 74, Andy Christensen explains how he followed prototype models of rail size, how new Portland Rail Century starting with Circle Trains Energy 261 coupler kits.

I hope I'm out of space, that there's plenty room to this issue, so go ahead and turn the page.

Contributing to Model Railroader

We welcome contributions from our readers, including articles, photographs and prototype drawings. For detailed information on submitting material to MR, contact our editorial associate Kris Dalpiaz at 800-766-9779, ext. 660, or kmraag@kmrag.com. Model Railroader assumes no responsibility for the safe return of unsolicited material. All accepted unsolicited material is intended for publication by Kalmbach Publishing Co. unless otherwise noted. We assume letters, questions, news releases and club news items are contributed gratis.

Model Railroader

Model railroading is fun!

LIVING LARGE

The EMD® "Centennial" — the largest diesel locomotive ever produced — is now available in HO scale.

Four road numbers (6921, 6934, 6936, 6946) represent the Union Pacific "Centennials" as they appeared from the late 1970s until their retirement in the mid 1990s. They feature cast mounted horn, ACI plates (except 6921), and "Union Pacific" in the shield. Also included is the not-a 6936, which still operates on special occasions. The 6936 has been modernized with a new cowl drum, roofing air conditioner, Timken bearings, lightning stripe paint scheme, winged UP shield on the nose, and more.

Besides the features you've come to expect from Genesis® locomotives, all of these locomotive models include two separate motors with individual drivetrains, SoundTraxx® Tsunami® sound equipped versions also have two individual sound systems.

Visit your favorite retailer today to add these locomotives to your roster.

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CHATHAM SHOW

MEMORIES

New range of products available from The Hobby Shop

June 2014:
The latest model railroad products, news & events

by Richard Bale and Jeff Shultz

Paul B. Scoles III, MMR
1943-2014

Paul Scoles passed away May 9 from complications following surgery. Paul was widely recognized in the model railroad community as one of the most creative scenery modelers in the hobby. He pursued model railroading as an art form and shared his philosophy and creative skills in numerous clinics, videos, books, and in more than 70 published articles.

Paul was generous with his time and welcomed visitors to view and operate his incomparable Sn3 Pelican Bay Railway & Navigation Company layout in the basement of his home near Seattle WA. Paul's wife Cynthia, plans to keep her husband's layout available to his local operating group.

A native of Lima OH, Paul earned his bachelors degree at Arizona State and a masters degree in philosophy at Northern Arizona University. He operated Ironwood Studio, a full-service recording studio with a list of clients that ranged from the Seattle Symphony to emerging garage bands.

Paul served his country as a combat infantryman with two tours of duty in Vietnam. In addition to several unit decorations, Paul returned from the war with personal awards including two Silver Stars, a Bronze Star with "V" device, two Purple Heart Medals, Republic of Vietnam Gallantry Cross Medal with Palm device, and Republic of Vietnam Campaign Medal with "60-" device. Paul suffered from painful shrapnel wounds in his legs throughout his life.

In addition to his wife Cynthia, Paul is survived by a son Eric, and two grandchildren. ...

TSI acquires The Great Train Expo

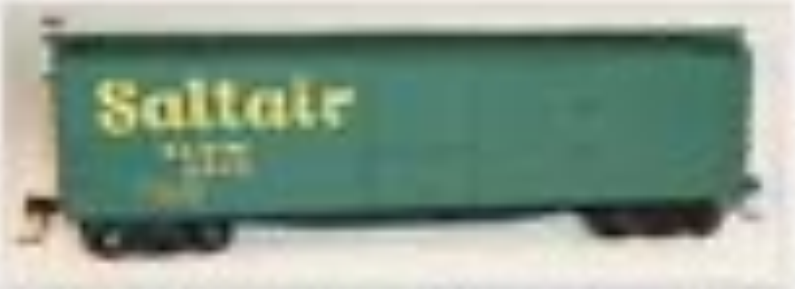
The Great Train Expo has been acquired by Train Show Inc (TSI). TSI is the parent company of The Great Midwest Train Show, World's Greatest Hobby on Tour, and Greenberg's Train and Toy Show. The announcement was made by TSI president Randy Bachmann who also owns Hobby Show Promotions which took over management of the annual iHobby Expo in 2018. Bachmann said they plan to sponsor shows in many of the venues formerly used by Great Train Expo, adding, "The purchase allows us to produce events from coast to coast and provides the opportunity to improve all our shows." A revised show schedule is expected to be posted at www.trainshow.com in the coming weeks. ...

Horizon Hobby/Athearn

Horizon Hobby/Athearn has posted career opportunities for experienced model railroaders with specialized professional skills interested in turning their avocation into their vocation.

The company is interested in hobbyists with experience in marketing, product development, creative design, and customer service. The positions currently open for consideration are Athearn brand manager, customer service representative, product developer, product development manager, and a graphic artist. For a detailed list of career opportunities visit horizonhobbycorp.com/careers.

CAR CLUB OFFERINGS



The **NMRA's Northern Utah Division** (northernutahnmra.org/club-car) is raising money through the sale of two unique HO scale car kits. The first is a 40' double-sheathed wood boxcar decorated for Salt Lake, Garfield & Western with a bold Saltair slogan. The color scheme of the car is based on SLG&W passenger equipment in use in the 1940s and '50s.

The second kit is for a USRA twin-bay hopper decorated for the Tooele Valley Railway. Both kits are manufactured by Accurail and include trucks and couplers. Visit the above website for pricing and ordering information.

Three custom cars are available now from the **Torrington Area Model Railroaders** (ctr-tmrr.org/clubcars.htm) of Torrington CT. The HO scale ready-to-run cars include a 50' Conrail K71 boxcar with one door painted green. The door on the opposite side of the unique car is the same color as the car body. The model is available at $30.00 each.

The second and third cars are Guilford/D&H Trainman PS-2 covered hoppers. One has a Guilford G (above) and the other a D&H shield. The covered hoppers are priced at $25.00 each. The PS-2 cars were produced for the club by Atlas. Visit the above website for ordering information.

NEW PRODUCTS FOR ALL SCALES

"Amtrak Power, Volume 3" has been released by **Morning Sun Books** (morningsunbooks.com). Authored by Stephen M. Timko, this volume completes the Amtrak Power series by covering the electric fleet from the historic GG-1s to the lesser-known Amtrak E4Bs. Metroliners, AEM-7s, HHPBs, RDCs, Turbos, and the Acela trains are all reviewed.

Additional new books available from Morning Sun include "Appalachian Coal Mines and Railroads in Color Volume 2: Virginia," featuring the work of noted Appalachian-area photographer Everett Young.

Also "Railroad Critters in Color Volume 5," with over 330 new photos of minority builders including Atlas, Davenport, Plymouth, Porter, Vulcan. Small industrial locomotives built by Baldwin, EMD, and GE are included.

Signature Press (signaturepress.com) has released "The State Belt – San Francisco's Waterfront Railroad." The book tells the story of the state-owned railroad that served the piers and industries of the San Francisco waterfront area, interchanging with Southern Pacific at King Street, and with Santa Fe, Northwestern Pacific, and Western Pacific by car float. Additional details including pricing are available at the above website.

O SCALE PRODUCT NEWS

Atlas O (atlaso.com) has released information about the next production run of Trainman series 60' heavyweight passenger cars. A coach has been scheduled for release during the 3rd quarter of 2014. It will be decorated for Burlington, Chesapeake & Ohio, Milwaukee Road, New York Central, and CNJ/NJDOT as illustrated here. Three-rail

versions of the O scale car will have an MSRP of $99.95. Cars equipped for two-rail operation will list at $104.95.

A baggage car (left), a combine, and a railroad post office car decorated for Milwaukee Road, New York Central, and Chesapeake & Ohio will also be available in the 3rd quarter. Details are available at the above website.

New models due from Atlas O during the 4th quarter of 2014 include a modernized 50' PS-1 plug-door boxcar. The thoroughly insulated car was designed to carry canned food stuffs that did not require refrigeration but did need protection from temperature extremes. The plug-style doors provided a tight seal to protect the load from dust and extreme shifts in temperature. Road names will include Missouri Pacific, CGW-Chicago & North Western, Chessie System, Union Pacific, and Southern Railway as illustrated here.

Also scheduled for release by Atlas O in the 4th quarter of 2014 is a group of Trainman 50' single- sheathed wood boxcars with double doors for auto service. Road names will be Northern Pacific, Santa Fe, and Western Pacific – all with Youngstown corrugated steel doors. A car decorated for Rock Island will be available with wood doors.

Atlas O has scheduled the delivery of a new run of its SW series diesel locomotives for the 1st quarter of 2015. The ready-to-run model replicates prototypes built by EMD in the late 1930s. Road names for the SW-8 will be Boston & Maine, Canadian National, and Rock Island. SW9 engines will be decorated for Indiana Harbor Belt and Missouri Pacific. SW900 versions of the ready-to-run O scale locomotive will include Reading and Raritan River as illustrated here. Both two-rail and three-rail versions will be available with optional Lionel Trainmaster Command and RailSounds 4.0. See the above website for details and pricing.

Morgan Hill Models (morganhillmodels.com) is selling a kit for an On30 28' low-side wood gondola. Included in the kit are cast resin frame and side stakes, Mt. Albert basswood for the sides and deck, and Grandt Line detail parts. The kit is available for $29.95 less trucks and couplers.

HO SCALE PRODUCT NEWS

The latest HO scale kits

released by **Accurail** (accurail.com) include a Great Northern 40' USRA double-sheathed wood box car. The kit has an MSRP of $16.98.

Also new from Accurail is a three-car set of ACF triple-bay covered hopper cars. As seen here, the cars are decorated for Chessie System in three different variations: B&O, WM, and C&O. The three- pack set has a list price of $52.98.

Accurail's Bessemer & Lake Erie USRA 55-ton twin-bay hopper represents a prototype built in 1918. The kit, which has an MSRP of $15.98, includes a decal renumbering set to allow the modeler to apply different numbers to a string of hoppers.

This 50' double plug-door steel boxcar is available from Accurail in kit form at an MSRP of $16.98.

A double herald SP-UP Pacific Fruit Express wood reefer is available from Accurail in a two-car set at $34.98. The HO scale model is based on a prototype built in 1923 and rebuilt in 1952. Trucks and couplers are included in all Accurail kits.

American Model Builders (laser-kit.com) has a new kit for a New York Central 19000 series wood caboose. The kit features numerous precision laser-cut components with laser-scribed sides. Details include cast resin platform steps and brake gear, cast white-metal smokejack, and injection molded turnbuckles. Several fixtures are shown to aid the modeler in replicating the handholds, ladders, and truss rods found on the prototype. Options for the model builder include square or rounded body corner posts, side windows that can be modeled open or closed, two different styles of end ladders and running boards, and variations on the end windows of NYC's distinctive low profile cupola. A set of screen doors and windows are provided along with custom decals and illustrated instructions that include information on painting and finishing the assembled model. The craftsman kit has an MSRP of $59.95. Trucks and couplers are not included.

Athearn's (athearn.com) next production run of Genesis SD60 locomotives will include three different BNSF paint schemes. The mix shown above (from the top) will include Heritage I, Heritage II, and a new BNSF experimental scheme. Additional road names in this release will be Norfolk Southern (Horsehead scheme), Conrail, and Union Pacific (SD60M). All are due to arrive in late December.

Also scheduled for release in late December are SW1500 locomotives decorated for Amtrak, Conrail, D&RGW (SW1000), BNSF (heritage), BNSF (wedge scheme), NS (Horsehead scheme), and NS (River Street Rambler scheme) as seen above.

Athearn will include a Ready-to-Roll® PS-2 2933 covered hopper in the December release. In addition to the SP car shown here with red lettering, other road names will be Reading, Grand Trunk (blue), Central of Georgia, and C&O (progress scheme).

An HO scale single dome tank car is also scheduled for release in late 2014. Road names will be UTLX, Indian Refining, GATX, Crystal/Red, and ATSF (above). The MSRP will be $26.98 each.

A group of 53' CIMC containers will be available in a three-pack at an MSRP of $29.98. Owner names will be Marten, HUB Group, EMP, CSX/Boxcar, CDFC Logistics, and Schneider as illustrated here. The HO scale stackable containers feature separate door closure rods.

Athearn's list of releases for late December concludes with a caboose; a steel bay window type with an MSRP of $29.98. Road names will be Chicago North Western (illustrated here), Western Pacific, Southern Pacific, Norfolk Southern, Erie Lackawanna, and FNM – Ferrocarriles Nacionales de Mexico. Some roads will have plugged windows depending on the practice of the prototype.

Atlas [atlasrr.com] is scheduled to release a new run of its Master series pulpwood flat cars during the 4th quarter of this year. The HO scale models come with a pulpwood load for the V-deck cars.

They will have an open or closed bulkhead depending on the practice of the prototype road which includes Delaware & Hudson, Louisville & Nashville, Frisco Line, Maine Central, Santa Fe, and Seaboard Coast Line. The ready-to-run models will have an MSRP of $34.95 each. An undecorated car will list at $24.95.

Also coming in the 4th quarter of this year is an Atlas Trainman® kit for a 1937 AAR 40' boxcar. Three numbers each will be available for Canadian Pacific (Spans the World slogan), Detroit & Mackinac, NC&StL (Dixieland slogan), New York Central (jade scheme), Union Pacific (Road of the Streamliners slogan), and Genesee & Wyoming. The kits will have an MSRP of $18.95. An undecorated kit will list at $13.95.

Bachmann (bachmanntrains.com) has released its Heritage series GE ES44AC and SD70ACe diesel locomotives. Decorating schemes available on the ES44AC are Central of Georgia, Lehigh Valley, Pennsylvania, Nickel Plate Road, and Southern Railway.

Decorating schemes for Bachmann's Heritage Edition SD70ACe include Wabash, Erie, Jersey Central Lines, Virginian, and New York

Central. Visit the above website for additional information including details on the sound systems available and pricing.

Additional new items from Bachmann include a Silver Series 50' 6" drop-end gondola. The HO scale ready-to-run model comes with different loads for each road name: Western Maryland (scrap load), Nickel Plate Road (tire load), Denver & Rio Grande Western (steel coil load), and Reading (crushed rock load). Visit the above website for pricing and availability on specific road names.

Over the next several months, **Broadway Limited Imports** (broadway-limited.com) will release individual cars for both the 1941 and 1953 versions of Southern Pacific's beautiful Daylight train. The skirted prewar cars (above) were lettered "Southern Pacific Lines". The postwar cars were not skirted and "Lines" was deleted from the letter board (next page).

The cars include a passenger-baggage combine, chair car, two-car articulated chair car, tavern car, three-car articulated café-kitchen-diner, and the parlor-observation illustrated here. Visit the above website for pricing and detailed specifications. BLI has created a video about the models viewable at broadway-limited.com/spdaylighttrainsho.aspx.

Bowser (bowser-trains.com) has scheduled a December delivery date for the next production run of Alco C-430 diesel locomotives. The HO scale Executive Line models will be available for Western New York & Pennsylvania (both black and red versions), New York Central, Susquehanna, Penn Central, Conrail (both blue and black versions), GBW, Lehigh Valley, Rock Island, and Alco Century demo scheme.

Bowser is accepting reservations for its GMD SD40-2 diesel locomotives until July 18. Delivery is planned for spring 2015. Road names for the HO scale version of the Canadian-built prototype will be Dakota, Minnesota & Eastern; Ontario Northland (as

delivered in green with yellow and red stripes); ON (yellow scheme with chevrons); British Columbia Railway (two-tone green); BC Rail (red, white and blue hockey stick scheme); and CP Rail (six different schemes). Visit the above website for pricing and reservation details.

Bowser has a selection of original Stewart F unit diesels equipped with LokSound Select Dual-Mode decoders and lighted number boards. Decorating schemes available for F3 units include New York Central, MKT, Maine Central, CGW, CB&Q, Milwaukee Road, and Soo Line. F7 diesel road names include Canadian National, Amtrak, Baltimore & Ohio, Lehigh Valley, Reading, Western Pacific, Rock Island, Missouri Pacific, L&N, Western Maryland, and Cotton Belt. F9 road names currently available include Santa Fe (blue and yellow freight scheme), Burlington Northern, D&RGW, and Milwaukee Road. A units are available for the F3, F7, and F9 locomotives mentioned above. For availability of matching B units as well as pricing for the Stewart F series locomotives visit their website.

Con-Cor [con-cor.com] is selling Pennsylvania Railroad class mP54 MU electric cars as refurbished in the 1950s. Upgrading the cars was accomplished at PRR's Wilmington Shops. The overhaul included replacing the old wooden window sashes with new, highly visible aluminum frames.

The PRR cars are available in the pre-war keystone scheme (above) and the post-war Pennsylvania scheme (below).

Most of the refurbished cars continued to operate into the Penn Central era and were repainted as shown below.

Visit the above website for pricing and ordering information.

Digital Fox (digitalfox.com) sells custom-decorated kits of various HO scale Accurail kits. Items currently available include a CROX-Central Soya 40' insulated plug-door boxcar with Dreadnaught ends at an MSRP of $16.99

Also available now is a PFE/WP 40' wood reefer based on a prototype originally built in 1924 and rebuilt in 1948. The reefer kit is available in six numbers at an MSRP of $17.99 each.

Scheduled for release later this month is an HO scale kit for a Nickel Plate Road 40' wood stock car. It will be available in three road numbers at an MSRP of $16.99 each.

Metal wheelsets can be substituted at $2.69 per kit. Visit the above website for ordering information including details about reduced pricing for multiple purchases of the same kit.

Division Point (divisionpoint.com) has imported brass models of New York Central 2-8-2 Mikado steam locomotives.

Handcrafted in South Korea by Bao Rim, the HO scale models accurately replicate the class H-10a and H-10b prototypes built at Schenectady in 1924. Visit the above website for additional details including a list of authorized dealers.

InterMountain Railway (intermountain-railway.com) has added four painted but unlettered models to the run of HO scale ES44DC Evolution series locomotives due for release late this

year. The unlettered versions will be available in black, white, silver, and gray. Fully decorated road names will be *BNSF* (Heritage II scheme), *BNSF* (new image scheme with black logo), CSX, Canadian National, and Norfolk Southern. The ready-to-run models will have an MSRP of $199.95 or $289.95 with sound.

Kadee (kadee.com) is scheduled to release an HO scale ready-to-run model of a Northern Pacific twin-bay covered hopper car in August. The HO scale model replicates a PS-2 prototype built in 1957 with eight round hatches and decorated with light gray alkali resistant paint.

Also coming from Kadee in August is a 40' steel boxcar with a 6' five-panel Superior steel door. The prototype was built in 1954. Kadee's HO scale ready-to-run kit will have an MSRP of $34.95.

This Nashville, Chattanooga & St Louis 50-ton Standard AAR twin-bay hopper is scheduled for release by Kadee in August. It will have an MSRP of $41.95 including the coal load.

Maple Leaf Trains (mapleleaftrains.com) is selling a cast resin kit for a GP9 slug. The principal contents of the kit are a resin cast body and frame, etched metal parts, cast resin details, and instructions. The HO scale model represents class GY00d and GY00e slugs (CN# 215-241).

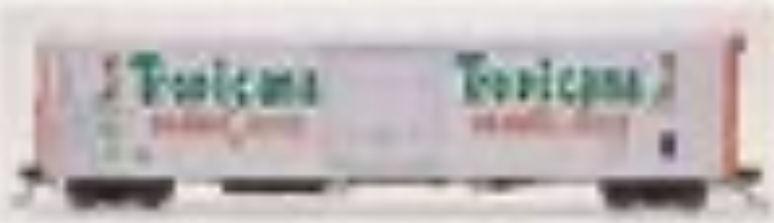
Trucks, sideframes, MU hoses, grab irons, and an LED for the headlight are not included.

NJ International (njinternational.com) has introduced a Barrel Rack kit with sufficient material to assemble a rack and 24 barrels. The HO scale kit is composed of molded plastic parts. Kit #6110 has an MSRP of $19.99.

In conjunction with Canada's Expo 67, a special train was assembled to tour the nation and promote the Expo as well as Canadian history. Named the Confederation Train, equipment was provided by both Canadian National and Canadian Pacific railroads. The consist included FP9As from both roads, a CN steam heater car, and several smooth-side passenger cars. All

of the equipment was decorated in a dramatic paint scheme designed especially for the train. To help signal the presence of the train, the locomotive horns were tuned to replicate the opening notes of "Oh, Canada."

Rapido (rapidotrains.com) has announced plans to produce an HO scale version of Canada's Confederation Train. In addition to the unique paint scheme, the locomotives will be equipped with dual-mode ESU LokSound decoders that replicate the "Oh, Canada" horn notes. Rapido will require a minimum of 300 reservations in order to proceed with this unique project. For complete details visit the above website.



Red Caboose will release its Tropicana 53' mechanical refrigerator car in several paint schemes late this year. There will be eight variations of the white car and four of the orange car.

The MSRP on the HO scale ready-to-run model will be $39.95. InterMountain Railway is responsible for marketing Red Caboose products. For additional information visit intermountain-railway.com.

Here is a preview photo of **Rivarossi's** newly-tooled GE U25C locomotive. The initial release of the HO scale ready-to-run locomotive is expected later this month. Two numbers each will be available for Chicago, Burlington & Quincy; Atlantic Coast Line; Northern Pacific; and Pennsylvania Railroad. Models equipped with DCC/Sound will have an MSRP of $299.99. Models for conventional DC operation will list at $219.99. According to Hornby America, Rivarossi's North American distributor, the new U25C will be manufactured from all new tooling and has no relation to the model Rivarossi introduced in the 1960s. For additional information visit hornbyamerica.com/shop/hornby/rivarossi/diesel-locos.

Virginia Foundry & Model Works is taking reservations for a resin kit for an HO scale 34' boxcar from the truss rod era. The prototype was a New York, New Haven & Hartford double-sheathed boxcar with an outside end sill built by the Michigan Peninsular Car Co. in 1895. The kit is composed of several cast

resin parts including the floor, doors, running board, bolsters, end sills, some support pieces, and a one-piece body. Kadee #5 couplers are included along with additional detail parts by Tichy, PSC, Bitter Creek, and Grandt Line. Trucks are either 30-ton Fox from Shapeway or Tahoe arch bar trucks with InterMountain metal wheelsets.

Prototype specific details provided in each kit allow it to be built to represent cars for the following road names: Kansas City, Pittsburg & Gulf; Rutland Railway; Armour & Company; Big 4; and New York, New Haven & Hartford (with Fox trucks, all others have arch bar trucks). The kits are priced at $41.00 each plus postage, however advance payment is not required. For additional information or to make a reservation send an email to John Canfield at jcan2x@hotmail.com.

Walthers (walthers.com) is accepting reservations for Proto series Union Pacific ES44M and ES8M locomotives. Delivery is scheduled for April 2015. The HO scale ready-to-run

models will be decorated in UP's Heritage scheme as applied to equipment used in excursion service from 1993 to 2000.

WalthersProto passenger equipment to match the UP Heritage E9 locomotives will be available beginning this October. The mix includes five ACF 85' cars: a coach, a dome-coach, a diner, a dome- diner, a dome-lounge (above), and a Budd-built 10-6 sleeper. All are HO scale ready-to-run models.

Walthers has just released a Mainline® series ALCo DL109 diesel locomotive. In addition to the Milwaukee Road scheme shown illustrated here, the HO scale ready-to-run model is available in four different New Haven liveries: McGinnis, Cranberry, Hunter Green with gray stripes, and Pullman green with simplified striping. Visit the above website for additional details and pricing.

Walthers is scheduled to release a group of PRR class N6B wood cabin cars with centered cupola in July. A total of six decorating arrangements will be available including the one shown here with a black cupola and a shadow keystone positioned above

the road name. The HO scale ready-to-run cabooses will have an MSRP of $44.98.

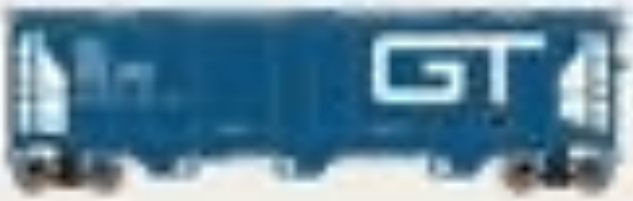
Westerfield Models (westerfieldmodels.com) has issued upgraded versions of its 2900 series kits for USRA steel boxcars. The remastered kits feature a one-piece cast resin body. The New York Central version has Dreadnaught ends. Cars with 7/8 Murphy ends are available for Cleveland, Cincinnati, Chicago & St. Louis; Peoria & Eastern; Hannibal Connecting Railroad; Northampton & Bath; Maine Central; Northern Ohio Railroad; and Bangor & Aroostook. The kits come with appropriate decals but without trucks or couplers. They are priced at $39.00 each.

York Modelmaking Ltd., (yorkmodelmaking.co.uk) sells an interesting selection of laser-cut kits including the foot bridge shown here. Although this item is OO (1:76) scale it can be effectively used in many HO settings. Visit the above website for additional information.

N SCALE PRODUCT NEWS

American Model Builders (laserkit.com) has a new kit for a Norfolk & Western class CF wood caboose. The N scale kit replicates the as-built prototype with the option of modeling the car with the original canvas covered roof or the metal roofing the prototype received in later years.

The kit features laser-cut components with laser-scribed birch plywood side, end walls, and cupola. Windows, doors, and trim are peel & stick. Additional details include metal end platforms, ladders, end railing, hand grabs, toilet hopper, tool box, and brake wheels. Also cast resin platform steps and brake gear, and a plastic smokejack. The illustrated instructions include information on painting and decaling the assembled model. The N scale kit has an MSRP of $31.95 less trucks, couplers, and decals (Microscale #60-482 recommended).



Athearn's (athearn.com) release schedule for December includes a PS-2 2893 covered hopper. In addition to the blue GT car shown here, road names will include Reading, Central of Georgia, C&O (progress scheme), and a gray SP car with red lettering. The N scale model will have an MSRP of $19.98 each.

Atlas (atlasrr.com) plans to release an N scale 40' PS-1 boxcar during the 4th quarter of 2014. Two numbers each will be available for Ann Arbor, Atlantic & West Point, Central of Georgia, Louisville & Nashville, Rock Island, Virginian Railway, and Great Northern. The N scale ready-to-run model will have an MSRP of $27.95. An undecorated version will list at $21.95.

Also coming from Atlas in the 4th quarter of this year is a 90 ton open hopper complete with a load of coal. The Trainman series model will be available in three numbers each for Conrail, BNSF, Burlington Northern, Clinchfield, Norfolk & Western, and Rio Grande. The ready-to-run model will have an MSRP of $18.95. An undecorated version of the N scale car will list at $13.95 each. All Atlas N scale cars come with AccuMate operating couplers.

Bachmann (bachmanntrains.com) has released an N scale EMD NW2 diesel switcher in five decorating schemes. In addition to the Great Northern version shown above, the ready-to-run locomotive will be available for Union Pacific, New York Central, and Pennsylvania Railroad. It will also be available painted yellow and black but without any lettering. The model has an MSRP of $149.00.

Fox Valley Models (foxvalley.com) has scheduled a new production run of it ES44AC GEVO locomotive for release late this year. New tooling will be used to produce three different bodies with three different cabs. Road names will be Citirail, UP (ES44A with new PTC antenna array) and General Electric Evolution Hybrid scheme as illustrated here. The N scale ready-to-run models will have an MSRP of $130.00. They will operate on standard DC and will accept an after-market DCC decoder (not provided) such as a Digitrax DZ125IN or TCS EVN651. InterMountain Railway is responsible for marketing Fox Valley products. For additional information visit intermountain-railway.com.

The Hobby Smith (hobbysmith.com) is selling N scale Spokane, Portland & Seattle Alco RS-3 diesel locomotives in the as-delivered maroon, olive green and tiger stripe scheme. Road numbers 95 and 98 are available as well as a painted but unnumbered version. The ready-to-run locomotive models are manufactured by Atlas for The Hobby Smith. They are DCC-ready and come with body-mounted couplers and directional lighting. The MSRP is $119.00 each or two for $218.00.

KatoUSA (katousa.com) plans to begin shipping two-packs of EMD F2 and F3 locomotives this month. The release includes Atlantic Coast Line (F2A, F2B), Chicago, Burlington & Quincy (two F2A), Rock Island (two F2A), and Chicago & North Western (two F3A).

All units are powered for standard DC operation. They are DCC ready and compatible for after- market decoders (not supplied) such as TCS KD08 or Digitrax DN163K0B. Visit the above website for pricing information.

Micro-Trains Line (micro-trains.com) has several new releases including this 50' Atchison, Topeka & Santa Fe double-door boxcar. This modern car is equipped with a Shock Control cushion underframe and ends with six non-terminating box rills.

Micro-Trains has decorated this 40' Chesapeake & Ohio boxcar with dark blue side and black ends and a large yellow C&O

logo. The C&O became part of the Chessie System in 1972 along with the Baltimore & Ohio and Western Maryland Railway. It was later combined with the Seaboard Coast Line and Louisville & Nashville, to become a key portion of CSX Transportation in the 1980s.

M-T continues to expand its selection of N scale heavyweight passenger equipment with the release of this 83' Pullman 12-1 sleeper. The car is painted in NYC post-war two-tone gray scheme. Centered below the window is the name East Alton.

Additional new N scale ready-to-run models from Micro-Trains include a 39' single dome tank car painted black with white lettering for the Mid-Continent Petroleum Corporation. Also new is a CB&Q 50' boxcar with double Youngstown doors. It has a full ladder but no running boards.

The prototype of this Northern Pacific 40' double-sheathed wood boxcar was built in 1925. The 4' monad and the Mainstreet slogan are post-1948. By 1966 the car was stenciled for hide service since its interior was not suitable for clean loading.

M-T modeled this DRGW 50' plug-door boxcar after a prototype built by Pacific Car & Foundry in 1962. The decorating scheme

on the N scale ready-to-run model includes a green "No Damage" stripe. Pricing and additional details on all Micro-Trains product can be viewed at the their website.

Rapido Trains [rapidotrains.com] is accepting reservations through June 13 for its new Canadian National GMD-1 diesel locomotive. The prototype was designed and built by General Motors, London, Ontario. Rapido's N scale version will be available with a DC/DCC dual mode ESU decoder or an ESU DC/DCC/Sound LokSound decoder.

In addition to the original GMD-1 1000 series with the cab interior configured for operation with the long hood forward, Rapido will also offer the 1988 rebuilt 1600 series GMD-1A. The rebuild involved reorienting the cab controls to run short hood forward. Additional changes included the installation of a chemical toilet with an access door in the short hood, relocating the batteries, and the addition of anticlimbers, ditch light brackets, and straight exhaust stacks.

Paint schemes will be Canadian National (green), CN (noodle, black), CN (noodle, black and red), and undecorated, all with DCC/Sound at an MSRP of $249.00 each. Models for standard

DC operation will list at $159.00. A power chassis only will also be available. Visit the above website for details including special pricing on models decorated for Northern Alberta Railways.

Red Caboose will release its Tropicana 53' mechanical refrigerator car in several paint schemes late this year. There will be eight variations of the white car and four variations of the orange car.

The MSRP on the N scale ready-to-run model will be $26.95. interMountain Railway is responsible for marketing Red Caboose products. For additional information visit intermountain railway.com.

NEW DECALS, SIGNS AND FINISHING PRODUCTS

New items from **Mask Island Decals** (maskislanddecals.com) include the PS-built Southern Hydro Cushion gondola shown on the next page.

Also new are five road names for 4750 triple-bay covered hopper cars including the Sands of Iowa set for a light blue car. The others are Tidewater Grain, Missouri Pacific (screaming eagle), Missouri Pacific (buzz saw medallion), and Farmers Coop. Added to the most recent listing are decals for a Great Northern 70-ton twin-bay covered hopper. Visit the above website to order.

New wet decals from **Microscale Industries** (microscale.com) include Southern Pacific 26' ore cars (above left); locomotives, freight cars, and cabooses for U.S. Army, Air Force, and Dept. of Defense (DODX); EMD Leasing (EMDX), and SOO Line (SOU) ex-Milwaukee "Bandit" locomotives (above right). All are available in N and HO scale. Also new are N, HO, and O scale decals for Southern Railroad (SOU) wood chip cars and gondolas.

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Briefly noted at press time...

. . . New ownership for the Great Scale Model Train Show

John "Scott" Geare and Michael Joseph Militello, owners of Makin' Tracks of Crozet, VA, have purchased the Ellicott City Scale Model Railroad Association and all of the Great Scale Model Train Shows from Howard Zane and Ken Young. Zane will be an active advisor to the new owners, as well as continue as a vendor at the shows he established in 1982. Young will provide training and high-tech support for the event. The new owners have pledged to continue the well-established pricing and exhibitor policies for vendors, and show attendees. The next Great Scale Model Train Show will be held June 21-23 at the Maryland State Fairgrounds, 2200 York Road, Timonium, MD. Inquiries should be directed to Scott Geare at sgeare@yahoo.com.

. . . Athearn

Athearn plans to deliver Genesis HO scale SD45-2 and F7 locomotives in late December in all new decorating schemes. The SD45-2 will be produced for CSX, Erie Lackawanna, Norfolk Southern, and two Santa Fe schemes: Bicentennial and Kodachrome. The F7 will be available for Penn Central, Rock Island, and Atlantic Coast Line.

Also coming from Athearn in late December is another run of HO scale GE Dash 9-44CW Ready-to-Roll® diesels in the livery of Santa Fe, British Columbia Railway, Chicago & North Western Burlington Northern, Norfolk Southern and Union Pacific.

Additional production runs of Athearn's PS 50' 5344 boxcars and a Trinity 5161 triple-bay covered hopper have been scheduled for delivery in November. We'll have road names for you next month. Also due in November are both HO and N scale versions of individual Husky Stack cars. Road names will be BNSF, CSX, Trailer Train, TTX, and TTX with new logo. We'll have photos and additional information on all of Athearn's latest products next month. ■

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How prototype locomotives are painted

Painting a prototype locomotive is a labor-intensive project that requires considerable time and expense, so most railroads repaint them on a 7- to 10-year cycle. Most of the costs involved are in cleaning, minor repairs, and surface preparation before any paint is applied.

Before the locomotive enters the shop, engineering drawings are made so there's never the guesswork as to the paint and color lettering. In the locomotive decals can be ordered. According to the Norfolk Southern, it requires about 60 gallons of primer and paint to refinish a typical six-axle road locomotive.

Most paint shops have their wash rack down in a trench or pit to catch dirt before. The dirt is the incoming key where the locomotive is cleaned. All debris is removed from the engine room, cab, and the space beneath the cab.

Parts that aren't to be painted, like cab windows, mirrors, gear, number boards, wiring problems, and rear view mirrors are removed, cleaned, repaired if needed and set aside for later reassembly.

Next, the locomotive is sprayed with a degreaser, all decals and stickers are removed, and it gets a thorough water-cleaning wash and rub.

The shop's second half continues the preparation work by doing the initial masking of the exterior cab glass, lights, and painted panels. Then a part blasting system is used to remove all of the old paint down to bare metal.

Then it's time to make the carbody repairs. Grill bags, dents, and other imperfections in the carbody are filled with a two-part epoxy automotive body filler. Once it hardens, it's sanded smooth, and the area cleaned to remove dust.

The third shop houses a large spray booth where the actual painting is done. It includes special color lighting, a powerful ventilation system, and scaffolding. Everything inside of the spray booth must meet strict federal, state, and local fire and safety regulations. The painters who work in the booth wear respirators. Two-tenths and bonded paints have toxic fumes, which explains why it's required to take these precautions, as is evident in the top right photo of the NS locomotive.

The engine and assembly painters' area is their own dirty, smelly, dangerous environment, and special masking paper and tape.

Painting a multi-step scheme like Norfolk Southern's Heritage 4 Series #4 no. 8 locomotive (Delaware & Hudson no. 10 "Rose Bud" locomotive) can take applied for the nose stripes and over the headlights.

are covered with special masking paper and tape. The couplers and trucks are then removed with plenty cleaning to keep them free of primer.

The application of paint process comes next. Primer is commonly sprayed on top of the locomotive first. Then the painters mask down the sides, ends, pilots, and interior surfaces.

Once it hardens, the primer is sanded smooth, and imperfections are repaired and then the dust cleaned off. Then the red and stripe areas (Norfolk Southern is one of light green or tan paint.

Next, it's time to apply the finish colors, usually working from the lightest to the darkest shades. The first finish paint application is usually the color of the lettering and striping. While this is drying, the inside of the plastic underside of the chassis, and the trucks are painted. Once these first colors are dry, it's time to mask the areas that need to be protected from the next color.

Masking tape is applied for all the striping, which adhesive results may be used for the road name and unit number. After the final color is applied and dry, the masking is removed to reveal the colors underneath.

Primer lettering and graphics are ready at most retail to adhesive scratch kits and come with an adhesive backing and a top masking sheet. These items are normally applied on the primer, and then overlapped with the other body colors. Once everything is dry, the top masking tape is peeled off to reveal the lettering. These pieces letters must then be smoothed along all the lower door edges with a cotton swab to help avoid paint rub when the doors are opened.

With a contrasting color is painted on all the cabin appliances, and are overall cleaned with everything in place.

The final step is to replace all the painted items, apply the warning and safety stickers, and close the windows so the locomotive is ready to return to service. — Jim Hediger, senior editor

High-side gondolas are unloaded by hand

I'm modeling in the [illegible] era and have a number of Accurail high-side gondolas. Since these cars don't have bottom doors, I'm curious how railroads unloaded them. I know other cars always during the service gauge one, but I can't imagine unloading these cars by hand on a regular basis.

Liam Finn, Altar Point, Calif.

In the "good old days," railroading was an unionized labor relations that were, what laborers were normally unloaded by a crew of workers who hand-shoveled the load over the side.

The Chevron of the console Western had a bunch of fat hobbies guys with drop doors in the floor allowing at least partial dumping of the load. You will now interested by laborers can in the openings.

Most cars gondolas had side doors, hinged at the top, so that's could be unloaded in the laborer and so long open. Most of the grain load would usually run out of the open doors, and any thing left had to be shoveled out through the side openings. — J. H. H.

Send your questions about prototype railroading or locomotive Model Railroader magazine, P.O. Box 1612, Waukesha, WI 53187, or e-mail us at mrmail@kalmbach.com. We regret we can't answer all the questions we receive.

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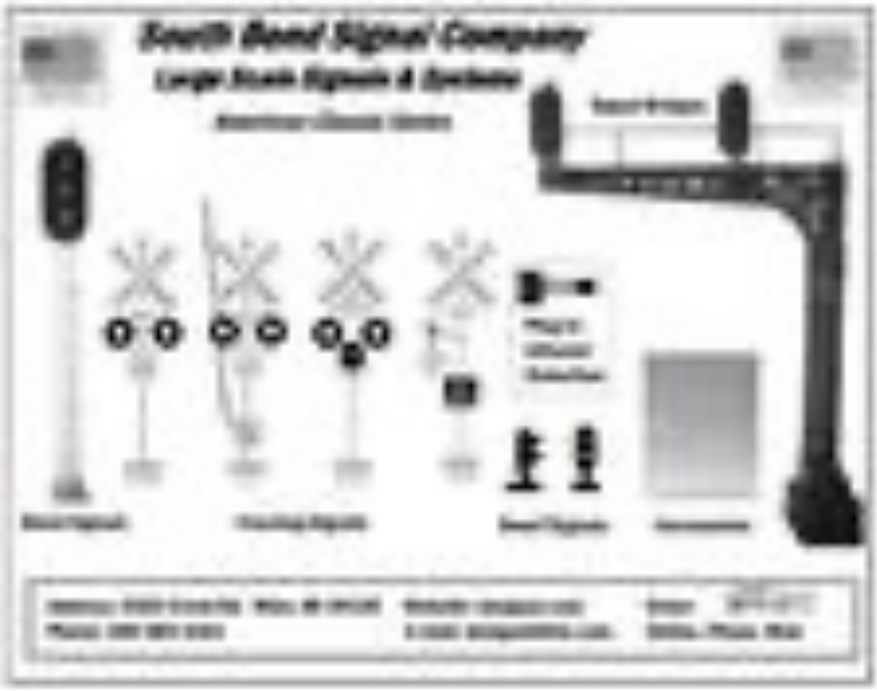

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Standards and Recommended Practices

When a new product arrives at Model Railroader, editors subject it to a number of tests and measurements. A basic tool in this process is the NMRA standards gauge shown above in N, HO and O scale standard gauge and On30 narrow gauge.

to some product reviews I keep seeing references to the National Model Railroad Association's Standards and Recommended Practices. What's the difference and where can I find this items?

Bill Tomecki • Chicago

When it was founded in 1935, the National Model Railroad Association's (NMRA's) primary goal was to develop interchangeable standards that would ensure interchangeability of locomotives and rolling stock between members' layouts. Thanks to the efforts of numerous volunteers with engineering expertise, the NMRA's organized and ad hoc bodies developed and maintain today's Standards and Recommended Practices, which continue to guide manufacturers and modelers today.

The original NMRA standards have been updated many times to stay up with developments in the hobby.

The current NMRA Standards and Recommended Practices can be found online at www.nmra.org.

According to the NMRA, a standard is "a figure, relationship, or dimension that's a standard," and must be followed for proper interchange of practices of its components. Changing a standard requires a membership vote. Many Standards cover only the factors and characteristics that are considered vital such as trackwork, wheels, clearances and electrical specifications.

The recent additions to the standards list brought the Digital Command Control (DCC) Standards and the electrical group, and Modular Standards have been completed to guide the development and construction of portable layouts.

Also according to the NMRA, the Recommended Practices (RPs) refer to "figures, relationships, or dimensions that the Engineering Committee has not validated through actual work and that are beneficial to operation."

The RPs cover a much wider range of topics with useful data and dimensions related to track performance, including gauges to check track and wheel dimensions, matching track curvature to suit any model lengths, turnout dimensions and details, body car characteristics, car weights, structures and wheel contours. Special versions of the RPs are provided for modelers using Digital Command Control (DCC) and module builders.

Conformance/Inspection Seal "Do NMRA fans or conventions hold inspections using their modular official inspection gauges to check if models meet all applicable NMRA Standards and Recommended Practices before a certification that allows the manufacturer to use the NMRA Conformance/Inspection Seal on the advertising and on packaging or cars in the photo at left.

Model Railroader is maintaining our model railroad work products to the appropriate NMRA Standards and Recommended Practices to support us how well their contents at the design areas and specifications. This useful source might helps to provide our read on with a good idea of how well a model will perform. It would then be a lot of disappointed inaccuracies in the tracks, wheelsets, and coupler height (on cars) likely to operate smoothly.

We also check our sample models against prototype drawings to evaluate how closely a new product matches the specific prototype's dimensions. — Jim Hediger, senior editor

Rice Harbor electrical connectors

What is the exact version of the Rice Harbor prop wire cables that Model Railroader used on the work shown on pages 54 and 55 of the March 2011 issue? My local Rice Harbor Project doesn't have a very knowledgeable salesperson to help me.

Charlie Lavalley • Cedar Rapids, Iowa

The Rice Harbor prop set is used for use on prototypical harbor environments in Rice Harbor lighting fixtures. It's the model shown here on 18-2 wire, and they were on the shelf next to the wire, nuts and other electrical parts. — J. D. H.

These three power plug sets are made for use in fluorescent light fixtures

John Hedrigan

Tunnel access

I have a questions about the right-sized 4-6 modeling an 8-foot tunnel. It'll be against a wall and hard to get to. So I need to figure on access. How do I keep that track clean, maintain right-of-access, and accessing the integrity of my scenery in the area? Matt Smithey, Shreveport, MO

Accessing any 8-foot tunnel is a bit like constantly shifting oil, it's not usually impossible, so I think I'd try to redesign the layout to eliminate the tunnel.

If it has to be there, I'd try to work at a remote access and behind the tunnel on the back of the tunnel you're opened on the big way for scenarios for any scenic solutions or maintenance work that may be required.

Many modelers have cut access openings through the tabletop such as this but this would and that works boy whole you're coming and location. But as we age, crawling under the tunnel becomes more of an issue.

There's no old access to the hobby that I truly believe "Very place that's not available on the layout will always become a major headache." – J. D. H.

Rusty diesel handrails

I have some Athearn HO diesel locomotives and enjoy them. My years and have a few extra handrails that are very worn attached or lost. How can I remove the rust without damaging the permanent? Dennis Mooney, Brighton, Victoria, Australia

Rust is a common complaint on the older Athearn handrails made from nickel-plated steel wire. To remove the rust, I use fine grit sanding sticks. I go from 180-grit, or a file, down to 600-grit. Then I carefully brush paint the handrails with a primer brush primer and paint inside the tunnel. – J.D.H.

Workshop Tips will pay $50 for published tips. Send your modeling and layout-building questions and ideas to Workshop, Model Railroader magazine, P.O. Box 1612, Waukesha, WI 53187, or e-mail workshop@kalmbach.com. We regret we can't answer all the questions we receive. There is no payment for questions. We are glad for your participation.

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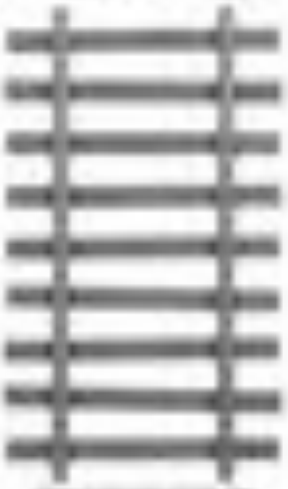

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What was going on last winter?

Cold and snow made a big impact on the motive power of North American railroads

Last winter was among the coldest and snowiest in many parts of the country as a mix that bedeviled the railroad industry. It's fundamentally likely and most environments ability to keep freight moving. As the last polluted dissipated, most carriers maintained the length of many, moving operating by participants to non-level trains and retaining people right environments motion. Some areas weather blocked railroads to park. Motive of trains due to responsible costly the high cores most reporting for days or accepting trains in one of an emergency track pulled train and in taking to cross-flow with power averages of number an of engines in cars shortcuts.

Locomotive electrical systems can be an threat to large amounts of thinning and shifting snow. One especially true with older EMD, engines locomotives. Dozens were taken out. Almost especially lower in one point carriers from failing trains than the compared could replace them under sustained locomotives.

Having all of the railroads have options.

The lowest and coldest was to deal with a months power shortage is to look within and new-known recent units. Canadian Pacific Union Pacific, and BNSF Railway took video-viewed Tools 4 and 4K every BNSF locomotives and put them back in service as late 2013 and early 2014. The most options was to look at the training that are to be short available. The complete BNSF training companies and other railroads with Union power.

Heavy motor weather caused railroads to operate reverse helpers. "The eight-unit Canadian Pacific train in these early had one CP-owned unit (C40-8W No. 9497) and seven foreign units: four from GE4, one leased unit, and one each from Union Pacific and BNSF. Chris Guss

BNSF locked in both advances clearing over the locking point 64 were trains several retailers along with a variety of motive such as it derailed Pacific the high-tech U.S. motive Ltd. and Tennessee Rail Corp. for classic 50 railroad "what's CSX brand power while Norfolk Southern placed its trains as patrol fuel in BNSF. A third major new service with new companies reporting months and motive retailers.

Facing intensive power shortages, one thought power from one railroad to another is new for held for longer periods of time and not shortcut. Having normal crash, many power run a new through many will normally operate to the first trains removed on the two railroad locks being powered and and track moves to renew. Holding foreign power has created positive feelings and old sightings of Kansas City Southern locomotives in New Jersey and CSX locomotives in the Florida Panhandle.

CN, CPR crews was used from Chicago across Illinois and Iowa. For example, was usually 4 or 5 percent of power in foreign on the corridor that is not with grain and inbound locations. At least one online 40 percent or more of the locomotives over at Chicago to CN units and the trains used BNSF locomotives.

One freight period winters was the use of distributed power, a tool that railroad railroads in the longer trains. Changing temperatures under it more difficult to keep a train line charged, and the cold reliable there is to shorten train lengths. The addition of distributed power locomotives that were at on the end of a train add another source of air, allowing greater lengths.

CN has a formal system for determining lengths of trains based on the ambient temperature.

The example was of distributed power or remotely trains in the various lengths were times allows the railroad to add an additional 1,000 feet of traffic to each train. Unfortunately CN, a railroad has a years in the use of the technology, one to short supply of distributed power equipped engines in certain areas the winter and hasn't yet to fully equip all trains with the technology.

With the weather hastening this spring, railroads are slowly starting to return to normal. The locked accessories and railroad vehicles remove the snow. Enough one can expect that to decrease in traffic levels begin to return to normal. Railroads choose over terrible locomotive that's making in severe performance now to protect for good train the spring to hold out hundreds weeks you can.

>> Green means Go!!! for Norfolk Southern

Norfolk Southern celebrated 10 years of industry advocacy organization Railfan by repainting rebuilt SD60E No. 6907 in Atlanta. Fry 70S trailers like and 20 other units in special paint schemes, including heritage and interim. Norfolk Southern via Twitter

GE readies BNSF natural gas test unit

[illegible] (GEMC No. 3622) undergoes testing at [illegible] Erie, Pa., plant in March. The unit is equipped with GE's ReadiFuel liquefied natural gas retrofit kit. No. 5613's and ReadiFuel demonstrator 5339(B) No. 4040 shared begin testing as BNSF this year. GE's ReadiFuel system can operate in a natural gas diesel mode or 100 percent diesel fuel if needed. [illegible]

[illegible] (GEMC) No. 3622 was a special scheme to commemorate the University of Kentucky's 2012 national college basketball championship. Sister GEMC No. 3623 was also repainted in early 2013 to honor the University of Louisville's 2013 win in the same tournament. No. 3623 was built as [illegible] (GEMC) No. 3467. [illegible]

[illegible] (GP15-1) No. 428 has been repainted into Richardson Provost's colors prior to shipment to Canada. Richardson Provost is Canada's largest privately owned agribusiness and is located primarily in Western Canada. The GP15-1 was originally [illegible] No. 8428, built in June 1978. [illegible]

[illegible] was a $225 million contract to build 20 diesel passenger locomotives for the states of Illinois, California, Michigan, Washington, and Missouri.

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Shaving steel off the rails

North American railroads examine rail milling as possible key to preventing broken rail

Rail milling machines use wheel-shaped milling heads with inserts or carbide grooved carbide inserts, such as this one shown from Germany, to shave defects from rails. Milling creates shavings (see photo below) that go like this. [redacted]

[redacted] damaged rails with track-bound machines that locate defects and problems in steel.

Similar in appearance to machines that use abrasive grinding wheels to shape rails, rail milling machines use carbide inserts that look more like cutters on a lathe. The inserts cut 0.1 to 1.2 millimeters deep into a rail to remove material, producing a chip instead of dust like rail grinding.

North American railroaders and researchers in milling still cite some metallurgical issues and broken rail, but most of the problems plaguing rail milling technology in the U.S. has subsided to rare, or damaged rails.

"It was the fact that the cracks are not deep in the profiling ... that the majority of rail breaks occur in the gauge corner area," said Brad Kerchof, Transportation Technology Center Inc. (TTCI) director of research and test. "We have seen that the cracking are not deep enough for us to economically justify milling them out. We don't currently have plans to do a big effort on grinding and move to milling rail."

Kerchof said others hope to open wheel rail milling because it is the most democratic to those rail fleets despite that it cuts that can also be grinding is efficient to pass, making cuts with one factor eliminating other and others milling can be used.

"Most milling heads generate an opportunity to face cut, and the worst shortage can not to that for no-service milling machines do not prevent the fine and that towards and control with rail grinding. This makes with

>> Shells and spalls and cracks, oh my!

[redacted] in milling as an effort to break down a rail shorter and completely cut out quality cracks and other tools to that are signs of rolling contact fatigue, or cracks/defects. Railroaders also monitored rail rolling contact fatigue from heavy, continuing freight trains regulate a major cause of rail breaks in North America. Milling may be able to repair rail that could otherwise be replaced when found damaged

ing structure on wooden trestles, open deck bridges, and in tunnels. That is exactly the reason Canadian National Railway Co. pursued interest in milling, said Kevin Hay, CN's track and structures manager.

Although for this and for others, speed on [redacted] is another consideration. Rail milling machine grinding machine can remove about 0.1 mm of rail at 4 to 5 mph in a single pass. Milling machine can remove 0.1 to 1 mm from the rail head each up to 7 mm from the gauge corner on the inside of a rail in a single pass. The milling depth depends on the machine and thickness of the cutting head, which varies in a single pass and the rail grinding is 1 and 0.2 mph. So while both technologies address rail defects, grinding and milling are not directly analogous.

For the cost in favor of using a milling machine is also balanced by production and consistency. Milling costs in Europe are calculated variously and have been reported in between rail profiles, or depths.

Railway maintenance crews at Metrolinx plan two secondary machines that cover and remove magnetic debris, or weld cavities, to remove surface roughness and the depth of any cracks. In a single milling machine operation can find and remove a surface defect, compacted layers of, and form a polished surface finish. Thanks to grinding machines, milling machines are [redacted] with two or more cutting heads at varying diameters. Many heads are the reverse or negative of the desired rail profile, in stages, rather cutting a ground ing wheel profiles the rail head smooth.

Among North American railroads CN, CSX Transportation, and Union Pacific have up to seven interest in milling. Yet only CN has put regulars milling into programs that is now implemented in more or [redacted].

Track materials in testing a milling are ready. While the material passenger rail roads Northeast Corridor does not require the weight and more from the heavy haul it railroads do. Except Israel, Australia's worst many maintenance districts uses milling and be the key to [redacted] rail from those locomotive wheels in [redacted] spinning in place.

[redacted] is Rahgozar Railway manager at rail Oakland, CA. He also publishes an online magazine, [redacted] the Journal of Rail Rail Infrastructure. [redacted]

>> More on rail management
[redacted]
[redacted]

Finding sand with sound

Michigan Technological University students create new device with tubing and teamwork

Running out of sand is not an issue standing on top of a locomotive in motion; weather or track age have been used as an excuse too often to complain over federal rules. To solve that dilemma a U.S. railroad could inform engineers at Michigan Technological University in Houghton, Mich., to come to another source.

The ultimate problem was twice faced by a Michigan Tech student who questioned what if there is an ultrasonic sensor enclosed in a PVC pipe that gauges the distance between the sensor and sand flowing through before in the pipe. It's essential to weigh just how to describe.

"To be honest, I thought we'd be able to do it with ease. When you consider the two main components and conditions that the [train] actually have to travel up to, you [realize] why sanders on the [railroad] are [a] key [component]."

"We [probably] spent the majority of our research [effort] [on] measurement," as we [which] were more problems up to the [end] business of the project. In turn, specifically, our device was [tracked] and a team of [the] [student] created model here to [measure] the [rate] and [height] of [sand] and [a] [sensor] from [the] [source] of [signal] [transducer], and getting [control] with [sand] and [dust].

"[With] [sand], [dust] [and], [rather] [the] [device] that [need] [to] weigh the [sand], [we] [can] [with] [attempt] with the [ultrasonic] [sensor]. The [material] [we] [could] [be] [accurately] [measure] [the] [the] [sand] [mass]."

"So what we [ended] [up] [...] [we] [in] [order] [a] [PVC] [pipe] [for] [the] [ultrasonic] [head] [...] [it] [can] [be] [used] [to] [keep] [more] [professionally] [...] [we] [in] [order] [a] [PVC] [pipe], [with] [a] [sensor] [for] [the] [sensor] [and] [we] [have] [a] [PVC] [pipe] [as] [a] [PVC] [guide]," [the] [team] [said].

"[We] [wouldn't] [want] [really] [accurate]. [A] [product] [we] [sell] [to] [the] [end] [to] [you]. "[We] [picked] [was] [a] [guide] [to] [it] [principle] [of] [the] [range] [distance]."

[And] [on] [top] [of] [that], [the] [student] [team] [built] [an] [LED] [dashboard] [that] [shows] [users] [criteria] [to] [use] [and] [maintenance].

[The] [team] [suggests] [that] [railroads] [support] [the] [network] [with] [an] [easily] [built] [accumulation].

"[We] [did] [that] [would] [for] [the] [best] [room] [on] [there], [as] [opposed] [to] [calculating] [every] [thing]," [— Terry] [Hoverter]

Students created a device to measure sand in a locomotive. [illegible]

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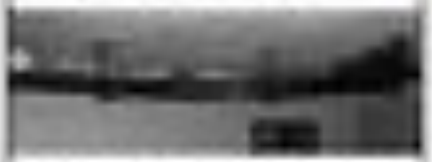

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BY BOB JOHNSTON

Eastward ocean at Moncton, N.B., on Feb. 10, 2014. One Ocean might be diverted by Albuquerque bridge crash [inset]. *Photographer: Greg Locke*

Tides turn on the 'Ocean'

VIA Rail Canada trains could end as early as July; carrier also faces congestion, equipment woes

When some people imagine retiring, up Inkwood Crossdancer Park on a future corn moon Wednesday day on our area to 30 mph or less. It's known as a time, you know: something to enjoy. Then, and other travelling aspects of an 11-hour round trip from Moncton to Montréal, VIA Rail's Montréal–Halifax overnight ride to rock Atlantic gem is now undoubtedly that I wonder passenger rail can work in a deep breath.

VIA Rail's daunted no tourist Montréal, Halifax, Time to see. I have been overcome because I another National islands is down this—it will make segment of its route as well as late. The railroad Montréal to get rid of the entire CN-wide Honorable Administration said the journey of Visit Montréal's stopped up with half of the 200 million dumbfound, unbelievably the numbers and auxiliary portions of the famous Bonaventure Railway monumentally more to the Maritimes, but did not provide in Oak Bank for the passenger train.

In Cross Road, the train cars drove on with new two-storey bridges over south of Railroad and the other, south of Moncton, N.B., because the tracks that CN and the provincial governments can not replaceable. Like aging locomotives that prompted VIA to discontinue service to Halifax's nearby Prince Edward's and Tancarville Island, these two bridges require significant service to rehabilitate. Nova Scotia's 48-mile figured that a long as a connection to freight companies continued, maintaining a place rail route across the province would be considered more.

Unfortunately, VIA's cutback of the Ocean from six days per week to six weekly in 2012 made the train too infrequent to cater to commuter travel between Montréal and Halifax. Ridership fell from 125,000 passengers a year to 80,000, and revenue dropped by more than 40 per cent. Despite the service cuts, VIA's annual subsidy for the Ocean has increased from $15 million to $20 million.

Now, VIA is considering a plan to replace the Ocean with a bus service that would operate between Montréal and Halifax via Saint John, N.B., and Moncton. The bus service would be operated by a private company under contract to VIA. The bus service would be operated by a private company under contract to VIA.

VIA's decision to replace the Ocean with a bus service is a result of a number of factors, including the declining ridership and revenue, the high cost of operating the train, and the need to invest in new equipment. The bus service would be operated by a private company under contract to VIA. The bus service would be operated by a private company under contract to VIA.

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Rich Yuan dressing up passengers with a Bali-style separate lounge car before departure from Eastport, Fla., in 2008.

First class in name only?

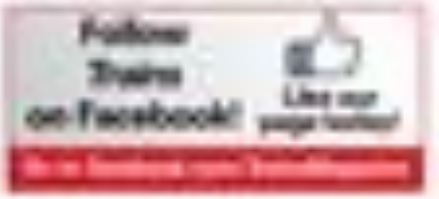
Six long, wide lounges, morning papers, and dining-car flowers

Talk about being abroad. Six Bali's ex-ready football tickets, Yuan patrons were pretty that the separate lounge car complimentary wine at dinner, and a well-stocked bar and more reception for dining car passengers were eliminated afternoon flights. For some trains as well as passengers that were well-done savings, both factors to the dining car, morning newspapers and other food were available simply be dropped in lieu of long distance trains by May 31.

In an email to passengers, long-distance General Manager Mark Murphy stated that the change was being "replaced with an all-inclusive snack car to allow greater seating capacity." However, Amtrak had already added a fifth coach to the consist on 17 separate days between Jan. 1 and March 31, 2010, on the trains that have lounges with both cars. Adding up to 44 coach seats, that's equal to an increase in total length to at least two extra cars to accommodate the additional volume.

A Yuan's entertainment, Yuan Pass pricing from Amtrak to accommodate each of their choice that depending upon day of departure, the fare for one passenger one way on a 5,000 miles change Lounge from $151 to $1 for a coach seat to $750 to $1,000 for a business seat $151-$999 in a bedroom. The amount can not be sure to generally but the set of $151 on trains and selecting with the header to compare for each the trains can be purchased in other classes. Although all passengers will still get a complimentary breakfast and dinner, a couple things are still now rather than up to 400 travelers.

Following a federal mandate and busy grant cut, Canadian Railroad plans to drop its tri-weekly Ocean South St. Marie, Ont., train, after April 30, summer only Agawa Canyon excursions will continue.



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Boarded-up windows, peeling paint, and a dilapidated roof are all signs that 102 Tower is days as an active interlocking are over. Cody Simcox shows how he modified this abandoned structure in this month's Step by Step.

How to model an abandoned interlocking tower

As we told you previously, manned interlocking towers are becoming a thing of the past on the Milwaukee Road. But the 1911 south shelf layout CSX Towne, built for the late Lowell Odegard for the layout's 1958 scene of Akron that models prototypical shelf-design functions on the original NYNJ in downtown Milwaukee. When Kalmbach Publishing Co. moved from the city to the suburbs, 102 Tower was saved and put on the scene remains on the current layout.

To give 102 Tower an authentic abandoned look, I studied prototype photos I could find. Between 1 weathered wood, shingle-sided roofs, boarded-up windows, broken glass on windows and boarded-over doors on working towers, plentiful rust spots, peeling and chipping paint and debris around the building, among other features.

If you model any crisp, business-like 1970s-and-today, an abandoned interlocking tower wouldn't be an appropriate sight on your layout. But creating abandoned structures is pretty much a slam-dunk project, so give it a try.

More on ModelRailroader.com

Watch my building sessions on the Model Railroader Facebook page, and read handy blueprints and more from the January 1968 issue online.

1 Build a base structure of 102 Tower following closely to article. I assembled the walls in 3" × 12" 10" structure using Evergreen sheet and strip styrene and detail castings from Grandt Line and Tichy Train Group. The only part I can't find is the Walther's no. 8020 plastic roof. See **step 4** for more on this roof.

To prepare the floor cutter wood's iconic variety, I undercoat the entire beam with Acrylmix Vallejo no. 70.601 gray surface primer. I let the primer dry overnight and then spray the beam with the same Tom Lu Bluebeam Flash (ref. 340) paint of the Patriots shown here.

After giving the paint 24 hours to dry, I use a 1" wide brush to apply a heavy-bronze wash (Terebenthin no. 702 211) to the beam. The color is part of the Iron & Rivets Surface Texture Set 2, available from Wathfactory. The wash brings out details in the weathering and clapboard siding.

I let the brown wash dry for 30 minutes. Then I dry-brush the walls with Acrylmix Vallejo Cavalry Brown and Wehrmacht Brown tone. 70.982 and 70.849, respectively. I dust it down the brush between colors. Through the effect is subtle, it makes it look as though the roofer has been repainted a few times.

Then I drybrush the siding with Mixing Black no. 70513 Underwood Light Gray. When combined with the wash and polychrome (two-dimensional) colors, the gray enhances the look of peeling and chipping paint. To prevent the gray from looking too heavy, I touch up the color in light layers. Don't forget to drybrush the corner trim. Anyway, darkeners, door moldings, and other areas where paint would wear off.

It wasn't like old roofing material to throw through in quite certain the new roofing materials I thought my greater way to cover Pegasus's no. 9998 plastic wood shake shingles with a pain and shirt. Rinse the shingle. I try to pass the maximum rounded roofing materials or nail like real cedar shakes but, as you can see, with limited success. I carefully removed the roof and built a new one.

After I build a new support from .080" plain sprues sheet, I apply Americajun Model Builders no. 202 ATSP shirt diamond shingles. Then I brush paint the shingles with Mixed Master no. 70999 Kevlar Gray. To give the shingles an aged look, I drybrush them with Underscale Light Gray.

Then I apply Americajun Model Builders three-tab shingles without from a previous project. I randomly omit shingles to reveal the diamond shingles underneath. As before, I brush paint the peel-and-stick shingles, but this time with Model Master no. 4887 Ozone Blue. I brush a few individual shingles with a lighter gray color to suggest repairs to the roof over the years.

To prevent condensation, bicycle pumps often placed over windows on livestock structures no longer in use. To capture that look I saw ¼" x ¼" sprue stock with one knife edge each, two lengths of matte ink to one pint of 50 percent isopropyl alcohol). Then I stained the boards with cyanoacrylate adhesive (CA).

Having all the windows inserted (wood mouth opening), I mask over another layer. I use the clear glazing included with the Trinity windows to model cracked and broken window panes. Then I brush the exterior of the clear plastic with Alclad II Aqua Gloss Pale Finish to give the glazing a shiny appearance.

Instead of rebranding, the three NYC signs I wanted them. First, I make a color copy of the signs from the January 1968 MR with the original OCT Trailer story. Then I re-brush them with Acrylicos Vallejo Model Color White no. 70.951. Once happy with the appearance I cut them from the page and attach them with white glue.

I brush paint the foundation with Model Master no. 2678 Aged Concrete. Once the color dries, I apply the burnt brown wash from **step 2**. To give the tower an overall flat look, I spray it with the Alclad II Clear Flat Finish. As you can see here, the model has a sufficiently aged look compared to Dandy to model.

Finally, I secure the area around the tower, secure the structure to the layout with white glue, and add some barrels, weeds, and the boards that used to cover the now-broken window near the base. Though OCT Tower is no longer publicly used, it will stand as a reminder of an earlier era on the MRRR!

Harkening back to the 1940's and 50's, an era when freight locomotives were treated with the same reverence as passenger units when it came to brute and non-catching paint schemes, Kato USA announces their road names of early F units to re-ignite the golden age of freight railroading!

These new packs of EMD® F3 locomotives each come with a pair of individually powered, DCC friendly locomotives available in this body style for the first time from Kato USA, as well as over 20 paint finishes and road names. Modelers can mix these locomotives to pull Kato's 106-6215 (10) Inland Freight Train set or utilize these with their existing fleet of freight cars as F7 locomotives for prototypical operations!

Recapture the golden age of freight railroading!

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BACK FROM THE DEAD

Mike Walsh drives the awe-inspiring reborn 2018 Karma Coupé built for BMW's 1940 Mille Miglia and is out destroyed decades ago

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Lever frames, points and signals

Pulling your railway like the prototype – 1

Peter Gilham introduces the principles of interlocking in last month's article, **[illegible]**. Across the next two parts he explains how the system can be implemented for a model railway using readily-available and cheap software from Microsoft.

7. [illegible]

[illegible]

8. [illegible]

[illegible]

9. [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

These HO-scale high-performance Magnetrol® air brake hoses simulate prototype brake system connections with magnetic glad hands. Installing these small parts is easier if you build a tool to help.

Add magnetic air brake hoses to HO rolling stock

Tiny magnets simulate operating glad-hand connections between cars

By Pete K. Saxberg • Photos by the author

When I found on Pacific Western Rail Systems (PWRS) had started manufacturing and selling ready-to-run Bullet Cars (40′ HC) in scale high-performance Magnetrol® air brake hose (hoses), I thought they looked very cool and highly realistic. I assembly gas cables and ordered some to equip my rolling stock.

Each package contains 8 pairs of magnetic brake hose and end rails for the brake piping used to assemble the two hoses. Many of my freight cars already had a brake pipe and brake hose already, so I was interested the original hoses off and glued a new hose to the pipe-brake.

A steady hand

I followed the installation instructions on the PWRS website, and a pair of hoses was easy, but even careful the

Fig. 1: Measuring jig. Pete made this handy jig from a ply 'T' knife blade so the brake loop magnet holds the hose at the proper angle for installation.

Fig. 2: Installation. With the hose aligned by the jig, Pete adds a drop of cyanoacrylate adhesive and slides the hose and wire glass against the pipe while the glue sets.

Fig. 3: Subassemblies. Pete has found it's easier to assemble the hose and brake pipes before he installs them. The magnets inside them are a metal like iron sphereopping.

Fig. 4: Installation. The brake pipe and air hose is mounted on the floor next to the coupler box. An extra drop or two of CA secures the pipes to sleepers

my hand wasn't steady enough to do such precise work you were.

According to the instructions, you grab the rubber hose with a pair of nose pliers, give a bit of gel type cyanoacrylate adhesive (CA) on the end of the brass and hold it rigidly on the end of the brake pipe.

I had some difficulty in holding the end of the pipe securely and it's recommended I still had to hold the hose steady for a minute while the glue cured.

This was almost impossible, and I accidentally pulled the hose off every time before the glue had set properly. I also discovered that the magnetic end attracted all sorts of the stuff out there, which didn't make things easier.

It soon became apparent that I had to find a different technique if the process of applying magnetic brake hose to air hose of rolling stock should be completed in the foreseeable future. But after a little thinking I came up with a tool to help

Hose installation

Figure 1 shows a simple device I made to help make hose mounting easier. It consists of the tip of a no. 11 scalpel blade (steel), sharp edge down, in a thinner jack, with a small slot of square section to locate the blade.

The glue hosed magnet at the end of the brake hose is attracted to the blade and sticks in it, holding the hose square with the glue cures. See Fig. 2. This tool works like the mounting brake hoses we can ring (single hose brake pipe details).

I use a different technique on cars that don't have brake pipe details. As shown in the illustrations, I make the brake pipes from the wire provided in the package. I then attach the brake hoses to the pipes before mounting them on the cars. I do this only on a magnetic flat tip, Fig. 3, so nothing moves when I glue the hoses to the pipes.

After mounting the brake pipes with hoses on the cars, I painted the wire pipe to match the car color. See Fig. 4. I also painted the glue hose magnet at the end of the hose silver. The black brake hose was made of a piece material so I gave them a thin coat of Tamiya rubber. For both no one else in the world looks. The success didn't affect the hose durability.

I've found that working with CA can easily become a messy affair. It can drip on your fingers, and it gets everywhere. I've even stuck one corner of a magazine without noticing it. When I grabbed a car to work on it, my finger stuck to it and left a nasty fingerprint. I'd rather that with oil storage, photocopiers or the more visible place.

More on ModelRailroader.com

Model Railroader subscribers can watch a video of Pete's jack and mounting an brake hoses to center at www.ModelRailroader.com.

Fire-damaged enginehouse

A variety of commercial parts were used to make this HO model **Lewis Gomme**

Most of us, at one time or another, have had the dreaded feelings of watching one of our prize locomotives burn a woodhole and the nearest train to see such a thing is a scenario I have developed to say the least. After a few years of this, an outside house burnt and it was devastating to say the least. After a few years ago, I decided to put that period behind in the middle of the track area. What do you do? Two others carefully put it back together to find another way for it.

Back at the turn-of-the-century, I remembered an article in Railroad Model Craftsman about George Sellon modeled a locomotive building. I had always wanted to build such a structure, but never had a use or a good excuse to do so. Someone else suggested that I "use it as an explanation kit," and such words came to mind. What a great way to display the locomotive. And that wouldn't you consider an excuse!

All the items needed were already in the workshop. Even good projects to working for a few weeks. I used a Campbell Scale Models 3½ mm Scale Wood on 3½ scale for the foundation walls. It measures 9" × 12" and is made from a clear polyethylene sandwiched between plastic. A Design Preservation Models Large Roundhouse Water Wall was used for the rear wall and the front section was made using a Design Preservation Models Smaller Turntable Water Tower. The windows and front are from Design Preservation Models Inc. and a Model Load Wall function and the wood frames and framing were made from an old remnant of plywood.

Whole walls, foundations and more

I started with a 4' × 8' piece of ½" hardboard and the remnant with building up, after painting it a dull black like a stone floor and glued a piece to the

middle as these 4" brick sections. Then it the segmentation lines.

The brick sections was made from a Chemik double-track, square punch. Five sections over the top of the punch were required, and two pieces left were glued back together to make up the three necessary new pieces.

The rear vertical cross wall and the one of the enginehouse was cut to width, and the adhere piece was glued to the top of the wall to get the correct height. Since the back of the building is covered up, the layout is such a way as to use two sections the size and was painted with the cut sides facing forward and the other side of the wall was covered with a piece of 3 ply balsa wood. The cross material used as the backing walls. After both the front and rear walls had the roof assembled, the roof was glued to the tops.

I weighed some sheet iron material to build sides of a 3½" × 4" piece of scrap to form the foundation walls. These were glued down to the base between the front and rear walls and represented using the ring on a drill.

Painting the stone material

The base color component is arranged as white and black, stainless, certain colors were used. Parts of this walls were given over coats of light gray on

Kit of materials

Plywood (thickness)
1m (3ft) x 60cm (2ft) sheet
1m (3ft) x 30cm (1ft) sheet

Hardwood Dowel (Rod)
1m (3ft) x 1.5 cm (½in) diameter

Plastic Packaging Material
1m (3ft) x 60cm (2ft) – large enough section for windows

Metal Scrap Material
1m (3ft) x 1.5cm (½in) wide strip enough

two large panels of 3mm plywood, one 60cm (2ft) square and the other 60cm x 30cm (2ft x 1ft). Use a pencil and ruler to draw the outlines of the front and back walls on the larger piece, and the two side walls on the smaller piece. Cut out the four pieces using a craft knife. Put on the outer protective envelope to a safe depth before cut-through is reached. Using a wider blade gives clean cuts. Refer to the photo and the key to identify the pieces you need to cut out. Use the knife to score the lines for the doorway and windows, and the roof hatch. Cut out the doorway and the roof hatch, but leave the windows in place for the moment.

The main components of the structure are a Complete Front Section (piece shown cut out) for the one side wall, a Discard piece (also which will cut apart and re-assembled to make the rear wall (left), and a Discard tunnel (centre) piece which was cut apart to make the front entrance.

to soften the effect of the other colors that have not already been applied.

Installing the windows and door

The Design Presentation Models also

have gaps. I secured my cuts and trimmed Polyethene grey plastic foil. Pre-cut's Books to Centering lines around the walls, which nothing a felt tipped. Pinpoint Soft Screws, Bolt and Washers and Mark corrugated to approx. cut-down brackets using a craft knife. Put on the outer protective envelope to a safe depth before cut-through is reached. Using a wider blade gives clean cuts. Refer to the photo and the key to identify the pieces you need to cut out. Use the knife to score the lines for the doorway and windows, and the roof hatch. Cut out the doorway and the roof hatch, but leave the windows in place for the moment.

an expensive wood glazed look. Use two of the wall sections and cut a door opening that cut in the front and a door opening. Clean the glue holding the window frames and check. I run the windows with a pair of pliers. Warm these from behind to make them appear as if they had been badly damaged in a fire.

Bolts, braces, studs, rafters and roof beams

For my scale I used small coffee stirrers and broke these with my fingers to have jagged edges. These were then glued vertically to the framing grill. For bolts pieces of rafting from card and to the front and back walls and the window panes was the windows and doorway.

The panels was lacquer with varnish to appear as steels and a rafter section was made for the front wall. As the beams look dark, very interesting rafters were needed, along with a heavy front of below wood.

The roof panels was constructed using wooden rafter beams and covered

Fire-damaged engine house

With scale in place, the building is taking shape. Note the removed side of the hardboard base to the front, the sequenced strip strips over the length of the side walls, the scenic cutting made from bamboo, cork tiles, stones and thin plaster coatings that have been chipped to give them a damaged look (above). The rafters and ceiling at left of the roof have been added and the sides of the building painted (above right). In this view (above left), the ridges of the roofing have been smoothed, while note the effect of the blank spray paint, which gives the walls a sooty appearance. A backboard engine, dirt, plaster and burned wooden beams will then complete scenes (below).

wide black acrylic paint and leave to dry as initial coating scorched. The windows and the doors were painted with black Cellulose Acrylic Sealer Primer and the engraved sliding way covered using a dustsheet, plastic and newspaper dust sheets, with an even touch of White Cellulose Acrylic Base Coat.

Starting the fire

With a spray bottle of water close at hand, I took extra window sections and a lit candle and carefully warped, singed and scorched the edges and edges of the wood around the buildings. Very light is with a low-level appearance.

After finishing some of the adhesive, clear acetate was used on the door windows and painted with a bottle to appear as cracked glass. Black hobby sheet was applied over the roof and to the large structure windows, so that the inner windows had remained when the fire blew the battery. Clear acrylic I sprayed the black paint into the structure base and let the wood look for a few seconds glow and with fire a few seconded look.

Finishing the scene

Then is where you can get as creative as you want. I took my darker tempera and set it on glass. Then I took scraps of balsa wood, along with the small pebbles that were stained black using them as the structure and placed them into the engine bay. Extra additional burnt strips were also glued in place so that it would appear as there fallen during the fire, along with the other bits of burnt debris.

To reproduce the colour that would have been caused over the base, partially covering the grass areas and other areas of the wood floor. Taking care not to have it out of place, the floor and was carefully covered with a mixture of paint and a little wide area that a spray bottle to load everything in place. It is a good, non-scaring. Then, using an old dropper, a mixture of dark paint, water and a few black drops of very dark was applied over the whole area. While the glue acrylic was still wet more pieces of long wood and other bricks were placed onto the dirt.

When allowing everything to harden for a day or two, the black spray paint was used to cover the dark brown the rest of the side covered. I added the same care to the window and let the fire paint spray scattered, which give a fire-damaged appearance to the inside of the structure. With the paint was still wet, I sprinkled brown fine dust over the scorched surface and to surround the fire black paint again. Finally, when it was still wet, I sprinkled on more ashes.

Added details to the scene

Some figures who appear to be inside the fire brigade or fire engine and to finish off the scene.

If you wanted to go further and create the fire more photographic look, you could add a flame and make these lights, blue colored lights or dry brush a bit of red paint onto some of the lights and to give the appearance of still glowing red. Be sure to include fire trucks and firefighting personnel along with some vehicles as before. The addition of a pattern of water causes using clear epoxy or Plasticfilm around the scene should finish it off nicely.

N&W J, HO
IN STORES NOW

N&W Y5b, HO
IN STORES NOW

Dreyfuss Hudson, HO
IN STORES NOW

ATSF 4-8-4, HO
IN STORES NOW

307 / 9, HO
IN STORES NOW

EMD SWITCHERS, HO
IN STORES NOW

C&O T-1, HO
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PRR J1, HO
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PART 2
INTERMEDIATE

The author's Bachmann Mastodon 4-6-0 has been converted to battery power and radio control, pictured at the April issue 2020. It's been further enhanced with a new Phoenix sound system. Read here how the sound system was installed.

Enhance your Bachmann 4-6-0

Part 2: Installing an aftermarket sound board

by Bill Carnahan | Trains Magazine | carnahan@trains.com

I may have followed the first part of this series in the April 2020 issue, your trusty personal radio-controlled Bachmann Mastodon 4-6-0 should be overhauling well in the garden or railway room (yours, it's time to install something an aftermarket sound board with some features. It was during the most recent pandemic that I finally got around to do it and really the only appreciable downtime I had while I was at work. We still did an aftermarket Phoenix Sound System V4 sound board in the engine. This board is a sound, two- or one-board designed for battery/radio-controlled locomotives. It's easy to install and is fully compatible with the Bachmann craft Articulated. Direct motion wire control in the engine. The sound system is also programmable if you wish to make the optional computer interface and software. I don't and have the computer interface. I ordered two 3V circuit programmed with the DIESEL sounds that I mentioned for the 4-6-0. There are four triggers on the V4 board, while you only have) triggers are for added with an optional board that connects to the V4.

Board-board connection

When it comes to installing sound boards, all have the same basic connections. Two wires provide power to the

1. Carefully lift the speaker out of the sealed vinyl purse it's in for the journey.

2. Wiggle and lift the new PCB socket off the plastic chassis.

3. Remove the black plastic knob that the PCB/LED fits to/fed to the inside front.

4. Remove the two Phillips head screws holding the board in the inside front.

Unsolder the two wires marked "+" and "-" from the speaker. Cut the two wires marked "+" and "-" from the plug that goes to the loudspeaker. Cut them near the sound board **photo 5**. This is to be kept as short as possible, so that the PA board sits flush with the speaker's rear edge when it's fitted. Next, cut the two wires and plug to the speaker (working back a **photo 6**, you can see the PA battery clips to the two inside from the right), and discard them. Strip the ends of the red and green wires leading to these. Connect these clips to existing 2mm female sockets on the PA board, red to + and green to -. Make sure you get the polarity correct, or the PA board won't work. Next, plug and push them in over the metal pins on the PA board.

Before you can remove the two PCB mounting screws and remove the PA board, you must unscrew the two screws holding the board to the inside front, marked in white in **photo 7**.

Now you can remove the two screws marked "+" and "-" coming from the plug that goes to the loudspeaker. Cut them near the sound board **photo 8**. This is to be kept as short as possible, so that the PA board sits flush with the speaker's rear edge when it's fitted. Next, cut the two wires and plug to the speaker (working back a **photo 9**, you can see the PA battery clips to the two inside from the right), and discard them. Strip the ends of the red and green wires leading to these. Connect these clips to existing 2mm female sockets on the PA board, red to + and green to -. Make sure you get the polarity correct, or the PA board won't work. Next, plug and push them in over the metal pins on the PA board.

Before you can remove the two PCB mounting screws and remove the PA board, you must unscrew the two screws holding the board to the inside front, marked in white in **photo 10**.

Mounting the boards in the inside front

Before mounting the boards in the inside front, you must wire in knob and wires PA to ensure it is in working order. The process to disable (remove) to the covered provided with the PA board and I'll see repeat it here. Either or your first time installing a sound board, wiring it can be a helpful learning experience.

Photo 11 shows the PA sound board with the wire wiring harnesses it comes with. It also shows a diagram explaining the three sockets (+, with seven wires (+, mid, 8) wires and (-, with four wires. Remember the fourth wire/wire as you do the wiring.

Carefully push the harness plugs in

5. Cut the wires from the "ground" leads and the two wires to the speaker, close to the sound board.

6. Remove the two plastic spruce that hold the old sound board in place.

7. Remove the screw and battery support from the holder floor.

8. Fit the surface mounts for mounting the boards.

9. The PIR board and wiring harnesses are shown, along with the socket diagram.

10. Apply double-sided foam tape to the bottom of the PIR board.

11. Place the fit board into place on the inside. Then, as shown

12. Apply double-sided tape as shown and peel off the backing

13. Position the speaker as shown

14. Once connected, the screen speaker wires can be rolled up and tucked out of the way

place as their supportive surface. We've all been there, haven't we? Well, this time, apply double-sided tape to the bottom of the PA board (**photo 09**) and position it on the inside front exactly as shown (**photo 10**).

Take new attention to the tiny 2mF surface mill attached to the screw. Apply the double-sided tape as shown in **photo 11** and position it next to the PA, as shown in **photo 12**.

Wiring it all up

With the boards in place, you can now wire everything together as per the diagram on the Elsevier instruction sheet, which I will cover step by step. The 4.7 ohm resistor on the PA has two 0.1mm speaker wires at 4.5 and 7.5 cm with a 2pin on the end. Simply cut off the plug, once the thickest speaker has an compatible plug. If you are using crimp connectors, crimp these to the leads you left on the speaker. If you are soldering, cut the leads off the speaker and solder the former wires to the speaker as shown) in **photo 13**. If you are making which way the former's wires are connected to the speaker. I will up the square former wires and test them in playback the PA board to hurry them out of the way.

Clacking sounds will be triggered by the shaft sensor wires making/break the 2pin header "wizard." There are the last pair/black shaft sensor wires we cut earlier in **photo 7**. I connect these to the orange and dark blue wires from 4.7/1 and 4.7/2 holes on crimp the dark blue wire from

15. Connect the orange wire from the fit board to the shaft sensor, and the dark blue wire to the black wire

the PA board to the black wire from the shaft sensor, and the orange wire from the PA to the red shaft sensor wire. After soldering, seal the heat-shrink with tape. Now wrap both wires with tape to keep them together (**photo 15**).

The last connection will bring power

10. The green wire from C13 on the PA goes to the "Input" terminal with the black wire on the socket.

11. The second green wire C11 connects to the mark control light via our loop.

12. Connect the grey wire from the PA to the black wire in the "Mute" terminal on the socket, and the orange wire to the red.

13. Plug the auxiliary output wire/socket into the socket with the black wire next to the plug.

14. Connect the light wire you've fitted to the dark blue wire C12 on the PA

from the one that's wired to the PA using the two green wires from C11 and C12 on the PA (marking with the green wire as C11). Attach a thickness tie (we've used a thin one that's wired "input" terminal (the way with the black wire as it as the right) as **photo 9B**, and tighten down the screw. I give a little tug on the wires after tightening the screw to make sure both wires are nicely connected. The other green wire from C11 connects to the socket with the red wire, as you in **photo 11**. The other the auxiliary (white) is green with the wire with the socket inside.

Now, connect the mains supply C14 lead C17 wire on the PA to the "Mains" terminals as two wires. There were no grey and orange C wires in the grey unit so the black wire on the socket and the orange wire to the red wire, as seen in **photo 12**.

If you plug in speaker to the fully assembled unit, then complete the wiring and you will be able to test the unit before connecting the sound triggers. My guess is no one the sound triggers to get the specific sounds I want, one by when I make these. When an assembly mode, some sounds as or more when one and can even them to because they are triggered by voltage changes or spark gaps in design.

Sound-trigger connections

With the mains wiring completed, you will make the connections to the sound trigger for the wheels, bell, engine sound, and blowdown. Remember once you choose one of the available sounds you want to trigger.

The first task is to plug the auxiliary wiring harness that were left we have routed into the socket, as shown on **photo 13**. Next, fit the socket into the front and pass it back into place via the one-shelf socket.

The first trigger to be installed is the whistle. It will be controlled by pressing the "A" button on the transmitter. Unless of using a switch the light blue wire on the receiver harness to the dark blue wire C13 on the PA harness (**photo 14**). If not doing, just the two wires with taped ends to shrink wrap, and cut it aside.

The bell will be controlled using the "J" button on the transmitter by connecting the green wire on the receiver harness to the brown wire C14 on the PA harness (**photo 15**). A coupler wires will be one method by twisting "A" on the transmitter, connect the yellow wire on the receiver to the yellow wire C15 on the PA (**photo 16**). The last triggerable sound, the locomotive, will be controlled by the "K" button on the transmitter. Connect the orange wire on the receiver harness to the violet wire C16 on the PA. Where the signal wire is dry, twist all the wires in twos them together (**photo 17**). The brown, red, and black wires remaining on the 8-core harness are not used and can be folded back the connected trigger wires and taped together.

This completes the wiring of the trigger. The final step is to tuck the wires of the receiver switch to prevent them from getting in the way of the moving parts of the loco. I normally like to fit a hook and eyelet (for instance method as the bonnet of the engine there, but in our case, it was not necessary). If you will be using the Electronic Sounds Ltd sound system, you may wish to wire the receiver switch to the loco chassis so that it can be switched on and off without removing the bonnet.

Testing and operation

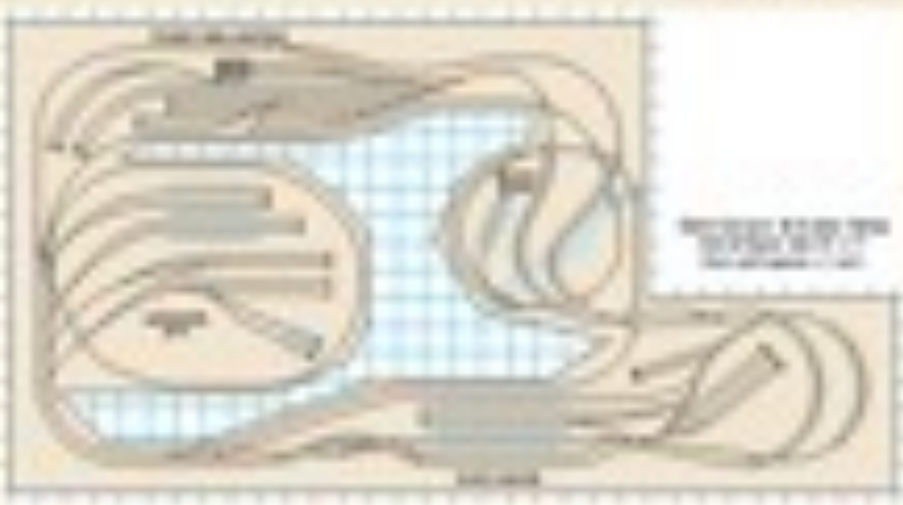
Online extras

Final thoughts

Fred Milliron describes the Dark Canyon and Snake River Railroad, a long-term project by **Ray Wicks**
Photographs by Fred Milliron

An American dream

An exhaustive N-ft layout



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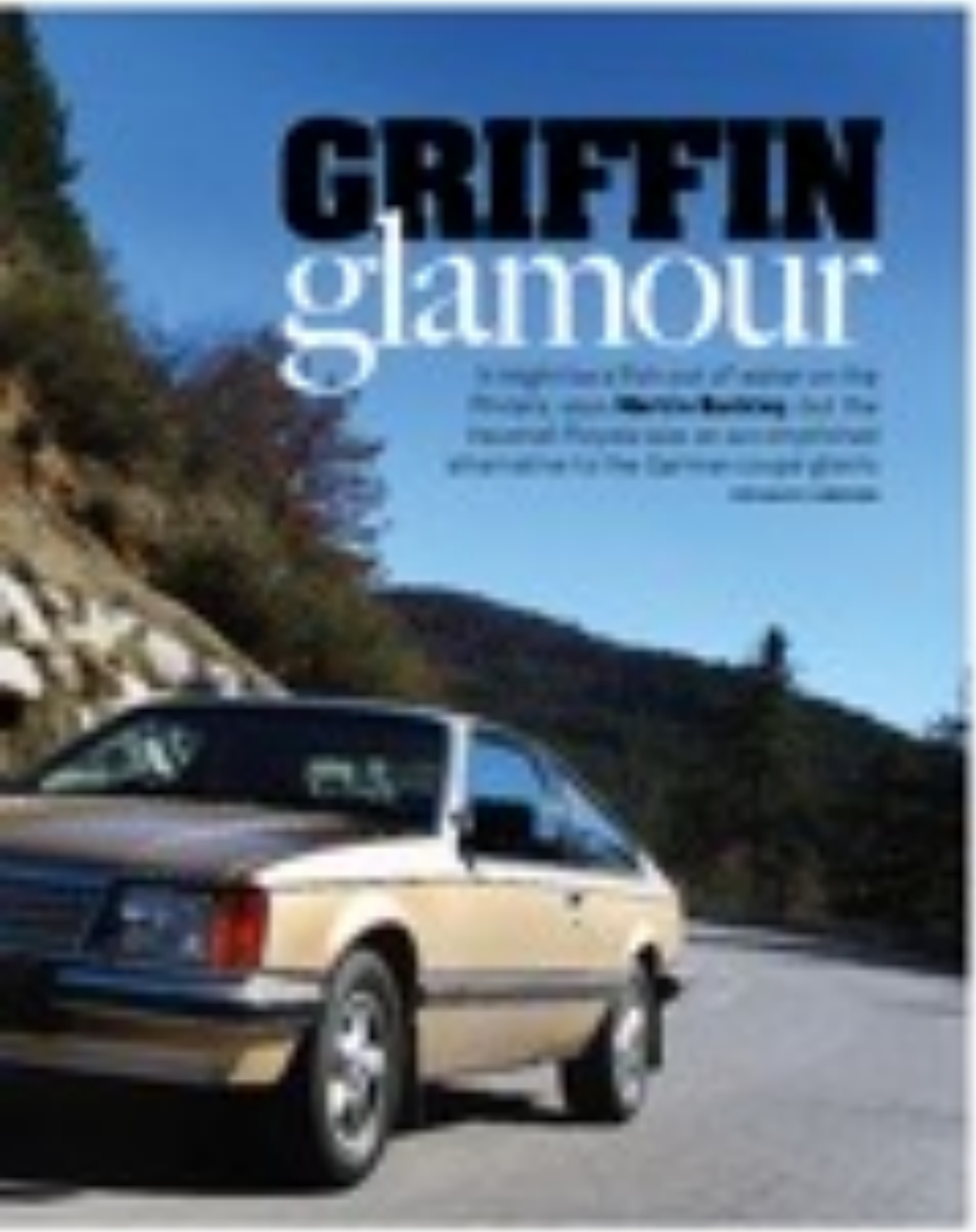
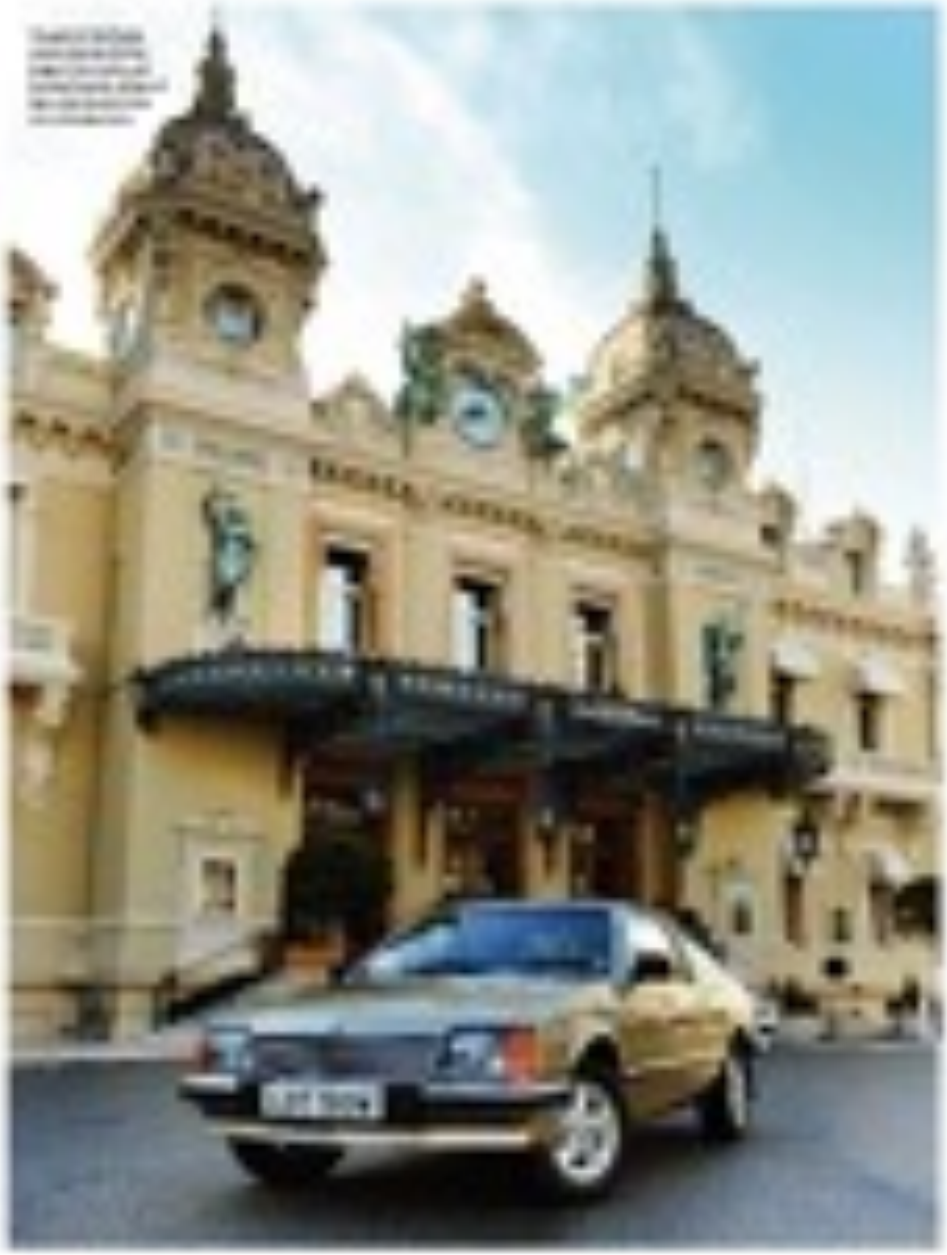


GRIFFIN glamour

A neighbour's Porsche out of sight on the Riviera, says **Martin Buckley**, but the resilient Porsche was an uncompromised alternative to the German coupe giant's newest classic



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Scratchbuilding a boiler flue storage rack

A sturdy addition to a steam engine servicing facility **Tom Troughton**

The author's five rack (top) is located next to his ex-depot shed. The plans for the shed were drawn in the 5in pitches when they used them. The 5in/50ft flue rack is 2ft longer and has an extra shelf. Both flue racks have a 2in/ft slope to the front to aid drainage.

Although Kirtley and Hawthorn locomotives of mid-pre-Victorian vintage were the mainstay of the Bluebell Railway's operations, the line's collection also included a number of later locomotives, including a Stroudley D1 0-4-2T and a Stroudley E1 0-6-0T. Both of these locomotives were built in the 1880s, and both were fitted with Ramsbottom safety valves. Ramsbottom safety valves were the first type of safety valve to be fitted to locomotives as a matter of course, and they were used on locomotives from the 1850s onwards. They were superseded by Salter safety valves in the 1870s, and by Pop safety valves in the 1880s. Ramsbottom safety valves were fitted to locomotives built before the 1880s, and they were also fitted to locomotives built after the 1880s, but they were not fitted to locomotives built between the 1880s and the 1900s.

Ramsbottom safety valves were fitted to locomotives built before the 1880s, and they were also fitted to locomotives built after the 1880s, but they were not fitted to locomotives built between the 1880s and the 1900s. Ramsbottom safety valves were fitted to locomotives built before the 1880s, and they were also fitted to locomotives built after the 1880s, but they were not fitted to locomotives built between the 1880s and the 1900s.

Ramsbottom safety valves were fitted to locomotives built before the 1880s, and they were also fitted to locomotives built after the 1880s, but they were not fitted to locomotives built between the 1880s and the 1900s. Ramsbottom safety valves were fitted to locomotives built before the 1880s, and they were also fitted to locomotives built after the 1880s, but they were not fitted to locomotives built between the 1880s and the 1900s.

The Arts-Environment Institute (above) demonstrates how the two rack supports were constructed. The 8'-0" long railroad rails were shaped through torched kerfings. They were notched and then secured with replacements. Note how the two triangular roof supports are attached to the rack/rail assembly in the plan shown above.

pieces of lean wood. The mostly long from 8' rails was then was the middle of the base of the rack. It's not normal to physical to see an extra piece. Make the fence rail of rack post into going to be marked in the concrete about a foot deep 2 rocks (more stone) 48 long. The posts are actually "reconstructions" or

horizontal. A 2x4 pieces at angle and glued together.

There are many cracks 48" long pieces with chevron pieces alternately spaced between them. The chevron pieces can secured to create an opening for the rail in an angled through hole. The hole of these holes is not at 45° from the bottom of the post then a post round to the height of the rail that a 1/2 piece of wood was added every other another grip the rounded piece of rail. A short piece of rail was added when need the 36" height was needed. The finished post rails are being 1/2" + 1/2" + 1/2".

Then was the supporting posts were assembled, I added additional blocks to them rocks (I still had a good supply of long 2x wood heads. To prevent splitting the base small pieces, what holes were drilled with a No. 11 drill. The holes were pressed into place using

the metal part of pliers. I've used to push by hands. Never break expensive large lag screws or bolts that would have been used to substitute in with the homeowners neighbors.

Triangular and supports were then it's an angle and were carefully cut on a polyurethane table saw and glued to on 4" notch cut was the outer edges rail were good creating a rabbit joint for added strength. Rack post involved two of the 8'-0" long (leaving 4-inch over universal on rack post which will about 48" of exposed rather than-used rails of the rack. So this point I realized that I had forgotten to cut footpads to have to support the triangular rail supports. However, it was easy to glues, that might work functional unless to the fact on these ratings on the rails.

Instead of diagonals, I decided on under which which out of this fence

This underside view of the rack (not correct for Evelyn) shows the triangular wood end supports and the thin plywood that supports the inset roofing pieces. Note the four pairs resting on lengths of rail. The pairs were made long enough to extend into holes in the layout's pike (naturally concealed) when finished to their full depth. The locations for the holes were marked, and then the slightly larger holes were made with a small electric carver's chuck.

stow rack. They were cut and trimmed to fit their correct with the resting retainer rail bolted in place with the two studs. The pairs were only added to the corners but at the end parts. These wouldn't be visible as the ends if they were added to all the corners and parts as I felt they all

With the triangular braces glued in place the height from the bottom of each joint to the point of the triangular end support was 3/8". Remembering to the last short the parts are bonded about two feet in the pinned, but which was the height of the ends is 7 1/2

A building bottom was made to size the four parts with their triangular end supports firmly glued in place, would be held in the appropriate distance apart. Four narrow rack by a straight line. With all the joint assembly in the bottom place, they were joined with a single coat to giving a area of 3 1/2 peripheral pin holes the bottom in each of the 20 side holes in the parts. Five 3 x 4 bracing wires also attached diagonally below the bottom rack to add additional strength and rigidity.

With the racks still in the fixture, nine pairs of 3 x 1/4 basswood were glued to the triangular end supports to support the corrugated metal roofing materials. The central pairs were 12" wide and glued to the ends so that they extended over the ends and were added. If they overlapped each other about the same distance. Rather than wasting as you will and having excess has not to the other end and assembly making up well, a separate piece is needed. I started here with one with twelve pieces making up to the ended with a polished piece. Prior to gluing the metal to the main rack sections I first that the pieces were colored and weathered with Rustoleum Brushed Aluminum primer before painting them. I put the 16 pieces in a small jar bottle and primed them with the fixture's thickness for a few seconds. The solution was poured off and the pieces stayed in more water and dried. They were then coated in Rustoleum Flat Clear Matting Solution for another minute or two until they were completely thinned. The pieces are attached to be tested and the roll pieces cleaned and dried.

The roof pieces were installed in their appropriate holes on the triangular ends by sliding them through the openings and removing them as they extended beyond the ends. Each piece fitted snugged in place, with carefully placed dabs of Tite Weld's commercial adhesive.

The Evans were interested from A&A Precision Metals (www.nrlmg.) Because of any technical question, and a couple from modeling friends I knew that the holes from the 16-bit and 8-bit registers were 0.1" to diameter. The chance I could make to find fasteners would using the brass rolling which would suite out at 0.1" dias. That would be close enough for our purposes. The 16-bit registers also used 0.1" for dials to get better pairing. Then was impossible to be using 0.1" rubbing. I took 0.1" rubbing which requirements of rubbing to any supply vendors and decided to use some of that one, any just to add more to the rack.

The holes were drilled in 1/4" holes, then each piece was attached into a Weather Teller and we and was drilled out with a numbered drill that was piled two available more smaller than the diameters of the holes. This helped ensure the appearance of that holes flow holes appear that those rubbing was hindered using the rubbers and pre-fitting processes.

The finished Evans were glued to the rack rails with two number fasteners on the upper brick and single

The rack (left top) contains three sizes of four-sided scale from dozen raising. Those on the upper rack are 1½" to diameter and represent 1½". Those the larger three are 3½" diameter and represent 4½". Note: These scales are to start at length. Because the diagonal between the first and second scales is 1½", the second scale is 3" from the first. The third scale is 4½" from the second. The fourth scale is 6" from the third. The fifth scale is 7½" from the fourth. The sixth scale is 9" from the fifth. The seventh scale is 10½" from the sixth. The eighth scale is 12" from the seventh. The ninth scale is 13½" from the eighth. The tenth scale is 15" from the ninth. The eleventh scale is 16½" from the tenth. The twelfth scale is 18" from the eleventh. The thirteenth scale is 19½" from the twelfth. The fourteenth scale is 21" from the thirteenth. The fifteenth scale is 22½" from the fourteenth. The sixteenth scale is 24" from the fifteenth. The seventeenth scale is 25½" from the sixteenth. The eighteenth scale is 27" from the seventeenth. The nineteenth scale is 28½" from the eighteenth. The twentieth scale is 30" from the nineteenth. The twenty-first scale is 31½" from the twentieth. The twenty-second scale is 33" from the twenty-first. The twenty-third scale is 34½" from the twenty-second. The twenty-fourth scale is 36" from the twenty-third. The twenty-fifth scale is 37½" from the twenty-fourth. The twenty-sixth scale is 39" from the twenty-fifth. The twenty-seventh scale is 40½" from the twenty-sixth. The twenty-eighth scale is 42" from the twenty-seventh. The twenty-ninth scale is 43½" from the twenty-eighth. The thirtieth scale is 45" from the twenty-ninth. The thirty-first scale is 46½" from the thirtieth. The thirty-second scale is 48" from the thirty-first. The thirty-third scale is 49½" from the thirty-second. The thirty-fourth scale is 51" from the thirty-third. The thirty-fifth scale is 52½" from the thirty-fourth. The thirty-sixth scale is 54" from the thirty-fifth. The thirty-seventh scale is 55½" from the thirty-sixth. The thirty-eighth scale is 57" from the thirty-seventh. The thirty-ninth scale is 58½" from the thirty-eighth. The fortieth scale is 60" from the thirty-ninth. The forty-first scale is 61½" from the fortieth. The forty-second scale is 63" from the forty-first. The forty-third scale is 64½" from the forty-second. The forty-fourth scale is 66" from the forty-third. The forty-fifth scale is 67½" from the forty-fourth. The forty-sixth scale is 69" from the forty-fifth. The forty-seventh scale is 70½" from the forty-sixth. The forty-eighth scale is 72" from the forty-seventh. The forty-ninth scale is 73½" from the forty-eighth. The fiftieth scale is 75" from the forty-ninth. The fifty-first scale is 76½" from the fiftieth. The fifty-second scale is 78" from the fifty-first. The fifty-third scale is 79½" from the fifty-second. The fifty-fourth scale is 81" from the fifty-third. The fifty-fifth scale is 82½" from the fifty-fourth. The fifty-sixth scale is 84" from the fifty-fifth. The fifty-seventh scale is 85½" from the fifty-sixth. The fifty-eighth scale is 87" from the fifty-seventh. The fifty-ninth scale is 88½" from the fifty-eighth. The sixtieth scale is 90" from the fifty-ninth. The sixty-first scale is 91½" from the sixtieth. The sixty-second scale is 93" from the sixty-first. The sixty-third scale is 94½" from the sixty-second. The sixty-fourth scale is 96" from the sixty-third. The sixty-fifth scale is 97½" from the sixty-fourth. The sixty-sixth scale is 99" from the sixty-fifth. The sixty-seventh scale is 100½" from the sixty-sixth. The sixty-eighth scale is 102" from the sixty-seventh. The sixty-ninth scale is 103½" from the sixty-eighth. The seventieth scale is 105" from the sixty-ninth. The seventy-first scale is 106½" from the seventieth. The seventy-second scale is 108" from the seventy-first. The seventy-third scale is 109½" from the seventy-second. The seventy-fourth scale is 111" from the seventy-third. The seventy-fifth scale is 112½" from the seventy-fourth. The seventy-sixth scale is 114" from the seventy-fifth. The seventy-seventh scale is 115½" from the seventy-sixth. The seventy-eighth scale is 117" from the seventy-seventh. The seventy-ninth scale is 118½" from the seventy-eighth. The eightieth scale is 120" from the seventy-ninth. The eighty-first scale is 121½" from the eightieth. The eighty-second scale is 123" from the eighty-first. The eighty-third scale is 124½" from the eighty-second. The eighty-fourth scale is 126" from the eighty-third. The eighty-fifth scale is 127½" from the eighty-fourth. The eighty-sixth scale is 129" from the eighty-fifth. The eighty-seventh scale is 130½" from the eighty-sixth. The eighty-eighth scale is 132" from the eighty-seventh. The eighty-ninth scale is 133½" from the eighty-eighth. The ninetieth scale is 135" from the eighty-ninth. The ninety-first scale is 136½" from the ninetieth. The ninety-second scale is 138" from the ninety-first. The ninety-third scale is 139½" from the ninety-second. The ninety-fourth scale is 141" from the ninety-third. The ninety-fifth scale is 142½" from the ninety-fourth. The ninety-sixth scale is 144" from the ninety-fifth. The ninety-seventh scale is 145½" from the ninety-sixth. The ninety-eighth scale is 147" from the ninety-seventh. The ninety-ninth scale is 148½" from the ninety-eighth. The one hundredth scale is 150" from the ninety-ninth. The one hundred and first scale is 151½" from the one hundredth. The one hundred and second scale is 153" from the one hundred and first. The one hundred and third scale is 154½" from the one hundred and second. The one hundred and fourth scale is 156" from the one hundred and third. The one hundred and fifth scale is 157½" from the one hundred and fourth. The one hundred and sixth scale is 159" from the one hundred and fifth. The one hundred and seventh scale is 160½" from the one hundred and sixth. The one hundred and eighth scale is 162" from the one hundred and seventh. The one hundred and ninth scale is 163½" from the one hundred and eighth. The one hundred and tenth scale is 165" from the one hundred and ninth. The one hundred and eleventh scale is 166½" from the one hundred and tenth. The one hundred and twelfth scale is 168" from the one hundred and eleventh. The one hundred and thirteenth scale is 169½" from the one hundred and twelfth. The one hundred and fourteenth scale is 171" from the one hundred and thirteenth. The one hundred and fifteenth scale is 172½" from the one hundred and fourteenth. The one hundred and sixteenth scale is 174" from the one hundred and fifteenth. The one hundred and seventeenth scale is 175½" from the one hundred and sixteenth. The one hundred and eighteenth scale is 177" from the one hundred and seventeenth. The one hundred and nineteenth scale is 178½" from the one hundred and eighteenth. The one hundred and twentieth scale is 180" from the one hundred and nineteenth. The one hundred and twenty-first scale is 181½" from the one hundred and twentieth. The one hundred and twenty-second scale is 183" from the one hundred and twenty-first. The one hundred and twenty-third scale is 184½" from the one hundred and twenty-second. The one hundred and twenty-fourth scale is 186" from the one hundred and twenty-third. The one hundred and twenty-fifth scale is 187½" from the one hundred and twenty-fourth. The one hundred and twenty-sixth scale is 189" from the one hundred and twenty-fifth. The one hundred and twenty-seventh scale is 190½" from the one hundred and twenty-sixth. The one hundred and twenty-eighth scale is 192" from the one hundred and twenty-seventh. The one hundred and twenty-ninth scale is 193½" from the one hundred and twenty-eighth. The one hundred and thirtieth scale is 195" from the one hundred and twenty-ninth. The one hundred and thirty-first scale is 196½" from the one hundred and thirtieth. The one hundred and thirty-second scale is 198" from the one hundred and thirty-first. The one hundred and thirty-third scale is 199½" from the one hundred and thirty-second. The one hundred and thirty-fourth scale is 201" from the one hundred and thirty-third. The one hundred and thirty-fifth scale is 202½" from the one hundred and thirty-fourth. The one hundred and thirty-sixth scale is 204" from the one hundred and thirty-fifth. The one hundred and thirty-seventh scale is 205½" from the one hundred and thirty-sixth. The one hundred and thirty-eighth scale is 207" from the one hundred and thirty-seventh. The one hundred and thirty-ninth scale is 208½" from the one hundred and thirty-eighth. The one hundred and fortieth scale is 210" from the one hundred and thirty-ninth. The one hundred and forty-first scale is 211½" from the one hundred and fortieth. The one hundred and forty-second scale is 213" from the one hundred and forty-first. The one hundred and forty-third scale is 214½" from the one hundred and forty-second. The one hundred and forty-fourth scale is 216" from the one hundred and forty-third. The one hundred and forty-fifth scale is 217½" from the one hundred and forty-fourth. The one hundred and forty-sixth scale is 219" from the one hundred and forty-fifth. The one hundred and forty-seventh scale is 220½" from the one hundred and forty-sixth. The one hundred and forty-eighth scale is 222" from the one hundred and forty-seventh. The one hundred and forty-ninth scale is 223½" from the one hundred and forty-eighth. The one hundred and fiftieth scale is 225" from the one hundred and forty-ninth. The one hundred and fifty-first scale is 226½" from the one hundred and fiftieth. The one hundred and fifty-second scale is 228" from the one hundred and fifty-first. The one hundred and fifty-third scale is 229½" from the one hundred and fifty-second. The one hundred and fifty-fourth scale is 231" from the one hundred and fifty-third. The one hundred and fifty-fifth scale is 232½" from the one hundred and fifty-fourth. The one hundred and fifty-sixth scale is 234" from the one hundred and fifty-fifth. The one hundred and fifty-seventh scale is 235½" from the one hundred and fifty-sixth. The one hundred and fifty-eighth scale is 237" from the one hundred and fifty-seventh. The one hundred and fifty-ninth scale is 238½" from the one hundred and fifty-eighth. The one hundred and sixtieth scale is 240" from the one hundred and fifty-ninth. The one hundred and sixty-first scale is 241½" from the one hundred and sixtieth. The one hundred and sixty-second scale is 243" from the one hundred and sixty-first. The one hundred and sixty-third scale is 244½" from the one hundred and sixty-second. The one hundred and sixty-fourth scale is 246" from the one hundred and sixty-third. The one hundred and sixty-fifth scale is 247½" from the one hundred and sixty-fourth. The one hundred and sixty-sixth scale is 249" from the one hundred and sixty-fifth. The one hundred and sixty-seventh scale is 250½" from the one hundred and sixty-sixth. The one hundred and sixty-eighth scale is 252" from the one hundred and sixty-seventh. The one hundred and sixty-ninth scale is 253½" from the one hundred and sixty-eighth. The one hundred and seventieth scale is 255" from the one hundred and sixty-ninth. The one hundred and seventy-first scale is 256½" from the one hundred and seventieth. The one hundred and seventy-second scale is 258" from the one hundred and seventy-first. The one hundred and seventy-third scale is 259½" from the one hundred and seventy-second. The one hundred and seventy-fourth scale is 261" from the one hundred and seventy-third. The one hundred and seventy-fifth scale is 262½" from the one hundred and seventy-fourth. The one hundred and seventy-sixth scale is 264" from the one hundred and seventy-fifth. The one hundred and seventy-seventh scale is 265½" from the one hundred and seventy-sixth. The one hundred and seventy-eighth scale is 267" from the one hundred and seventy-seventh. The one hundred and seventy-ninth scale is 268½" from the one hundred and seventy-eighth. The one hundred and eightieth scale is 270" from the one hundred and seventy-ninth. The one hundred and eighty-first scale is 271½" from the one hundred and eightieth. The one hundred and eighty-second scale is 273" from the one hundred and eighty-first. The one hundred and eighty-third scale is 274½" from the one hundred and eighty-second. The one hundred and eighty-fourth scale is 276" from the one hundred and eighty-third. The one hundred and eighty-fifth scale is 277½" from the one hundred and eighty-fourth. The one hundred and eighty-sixth scale is 279" from the one hundred and eighty-fifth. The one hundred and eighty-seventh scale is 280½" from the one hundred and eighty-sixth. The one hundred and eighty-eighth scale is 282" from the one hundred and eighty-seventh. The one hundred and eighty-ninth scale is 283½" from the one hundred and eighty-eighth. The one hundred and ninetieth scale is 285" from the one hundred and eighty-ninth. The one hundred and ninety-first scale is 286½" from the one hundred and ninetieth. The one hundred and ninety-second scale is 288" from the one hundred and ninety-first. The one hundred and ninety-third scale is 289½" from the one hundred and ninety-second. The one hundred and ninety-fourth scale is 291" from the one hundred and ninety-third. The one hundred and ninety-fifth scale is 292½" from the one hundred and ninety-fourth. The one hundred and ninety-sixth scale is 294" from the one hundred and ninety-fifth. The one hundred and ninety-seventh scale is 295½" from the one hundred and ninety-sixth. The one hundred and ninety-eighth scale is 297" from the one hundred and ninety-seventh. The one hundred and ninety-ninth scale is 298½" from the one hundred and ninety-eighth. The two hundredth scale is 300" from the one hundred and ninety-ninth. The two hundred and first scale is 301½" from the two hundredth. The two hundred and second scale is 303" from the two hundred and first. The two hundred and third scale is 304½" from the two hundred and second. The two hundred and fourth scale is 306" from the two hundred and third. The two hundred and fifth scale is 307½" from the two hundred and fourth. The two hundred and sixth scale is 309" from the two hundred and fifth. The two hundred and seventh scale is 310½" from the two hundred and sixth. The two hundred and eighth scale is 312" from the two hundred and seventh. The two hundred and ninth scale is 313½" from the two hundred and eighth. The two hundred and tenth scale is 315" from the two hundred and ninth. The two hundred and eleventh scale is 316½" from the two hundred and tenth. The two hundred and twelfth scale is 318" from the two hundred and eleventh. The two hundred and thirteenth scale is 319½" from the two hundred and twelfth. The two hundred and fourteenth scale is 321" from the two hundred and thirteenth. The two hundred and fifteenth scale is 322½" from the two hundred and fourteenth. The two hundred and sixteenth scale is 324" from the two hundred and fifteenth. The two hundred and seventeenth scale is 325½" from the two hundred and sixteenth. The two hundred and eighteenth scale is 327" from the two hundred and seventeenth. The two hundred and nineteenth scale is 328½" from the two hundred and eighteenth. The two hundred and twentieth scale is 330" from the two hundred and nineteenth. The two hundred and twenty-first scale is 331½" from the two hundred and twentieth. The two hundred and twenty-second scale is 333" from the two hundred and twenty-first. The two hundred and twenty-third scale is 334½" from the two hundred and twenty-second. The two hundred and twenty-fourth scale is 336" from the two hundred and twenty-third. The two hundred and twenty-fifth scale is 337½" from the two hundred and twenty-fourth. The two hundred and twenty-sixth scale is 339" from the two hundred and twenty-fifth. The two hundred and twenty-seventh scale is 340½" from the two hundred and twenty-sixth. The two hundred and twenty-eighth scale is 342" from the two hundred and twenty-seventh. The two hundred and twenty-ninth scale is 343½" from the two hundred and twenty-eighth. The two hundred and thirtieth scale is 345" from the two hundred and twenty-ninth. The two hundred and thirty-first scale is 346½" from the two hundred and thirtieth. The two hundred and thirty-second scale is 348" from the two hundred and thirty-first. The two hundred and thirty-third scale is 349½" from the two hundred and thirty-second. The two hundred and thirty-fourth scale is 351" from the two hundred and thirty-third. The two hundred and thirty-fifth scale is 352½" from the two hundred and thirty-fourth. The two hundred and thirty-sixth scale is 354" from the two hundred and thirty-fifth. The two hundred and thirty-seventh scale is 355½" from the two hundred and thirty-sixth. The two hundred and thirty-eighth scale is 357" from the two hundred and thirty-seventh. The two hundred and thirty-ninth scale is 358½" from the two hundred and thirty-eighth. The two hundred and fortieth scale is 360" from the two hundred and thirty-ninth. The two hundred and forty-first scale is 361½" from the two hundred and fortieth. The two hundred and forty-second scale is 363" from the two hundred and forty-first. The two hundred and forty-third scale is 364½" from the two hundred and forty-second. The two hundred and forty-fourth scale is 366" from the two hundred and forty-third. The two hundred and forty-fifth scale is 367½" from the two hundred and forty-fourth. The two hundred and forty-sixth scale is 369" from the two hundred and forty-fifth. The two hundred and forty-seventh scale is 370½" from the two hundred and forty-sixth. The two hundred and forty-eighth scale is 372" from the two hundred and forty-seventh. The two hundred and forty-ninth scale is 373½" from the two hundred and forty-eighth. The two hundred and fiftieth scale is 375" from the two hundred and forty-ninth. The two hundred and fifty-first scale is 376½" from the two hundred and fiftieth. The two hundred and fifty-second scale is 378" from the two hundred and fifty-first. The two hundred and fifty-third scale is 379½" from the two hundred and fifty-second. The two hundred and fifty-fourth scale is 381" from the two hundred and fifty-third. The two hundred and fifty-fifth scale is 382½" from the two hundred and fifty-fourth. The two hundred and fifty-sixth scale is 384" from the two hundred and fifty-fifth. The two hundred and fifty-seventh scale is 385½" from the two hundred and fifty-sixth. The two hundred and fifty-eighth scale is 387" from the two hundred and fifty-seventh. The two hundred and fifty-ninth scale is 388½" from the two hundred and fifty-eighth. The two hundred and sixtieth scale is 390" from the two hundred and fifty-ninth. The two hundred and sixty-first scale is 391½" from the two hundred and sixtieth. The two hundred and sixty-second scale is 393" from the two hundred and sixty-first. The two hundred and sixty-third scale is 394½" from the two hundred and sixty-second. The two hundred and sixty-fourth scale is 396" from the two hundred and sixty-third. The two hundred and sixty-fifth scale is 397½" from the two hundred and sixty-fourth. The two hundred and sixty-sixth scale is 399" from the two hundred and sixty-fifth. The two hundred and sixty-seventh scale is 400½" from the two hundred and sixty-sixth. The two hundred and sixty-eighth scale is 402" from the two hundred and sixty-seventh. The two hundred and sixty-ninth scale is 403½" from the two hundred and sixty-eighth. The two hundred and seventieth scale is 405" from the two hundred and sixty-ninth. The two hundred and seventy-first scale is 406½" from the two hundred and seventieth. The two hundred and seventy-second scale is 408" from the two hundred and seventy-first. The two hundred and seventy-third scale is 409½" from the two hundred and seventy-second. The two hundred and seventy-fourth scale is 411" from the two hundred and seventy-third. The two hundred and seventy-fifth scale is 412½" from the two hundred and seventy-fourth. The two hundred and seventy-sixth scale is 414" from the two hundred and seventy-fifth. The two hundred and seventy-seventh scale is 415½" from the two hundred and seventy-sixth. The two hundred and seventy-eighth scale is 417" from the two hundred and seventy-seventh. The two hundred and seventy-ninth scale is 418½" from the two hundred and seventy-eighth. The two hundred and eightieth scale is 420" from the two hundred and seventy-ninth. The two hundred and eighty-first scale is 421½" from the two hundred and eightieth. The two hundred and eighty-second scale is 423" from the two hundred and eighty-first. The two hundred and eighty-third scale is 424½" from the two hundred and eighty-second. The two hundred and eighty-fourth scale is 426" from the two hundred and eighty-third. The two hundred and eighty-fifth scale is 427½" from the two hundred and eighty-fourth. The two hundred and eighty-sixth scale is 429" from the two hundred and eighty-fifth. The two hundred and eighty-seventh scale is 430½" from the two hundred and eighty-sixth. The two hundred and eighty-eighth scale is 432" from the two hundred and eighty-seventh. The two hundred and eighty-ninth scale is 433½" from the two hundred and eighty-eighth. The two hundred and ninetieth scale is 435" from the two hundred and eighty-ninth. The two hundred and ninety-first scale is 436½" from the two hundred and ninetieth. The two hundred and ninety-second scale is 438" from the two hundred and ninety-first. The two hundred and ninety-third scale is 439½" from the two hundred and ninety-second. The two hundred and ninety-fourth scale is 441" from the two hundred and ninety-third. The two hundred and ninety-fifth scale is 442½" from the two hundred and ninety-fourth. The two hundred and ninety-sixth scale is 444" from the two hundred and ninety-fifth. The two hundred and ninety-seventh scale is 445½" from the two hundred and ninety-sixth. The two hundred and ninety-eighth scale is 447" from the two hundred and ninety-seventh. The two hundred and ninety-ninth scale is 448½" from the two hundred and ninety-eighth. The three hundredth scale is 450" from the two hundred and ninety-ninth. The three hundred and first scale is 451½" from the three hundredth. The three hundred and second scale is 453" from the three hundred and first. The three hundred and third scale is 454½" from the three hundred and second. The three hundred and fourth scale is 456" from the three hundred and third. The three hundred and fifth scale is 457½" from the three hundred and fourth. The three hundred and sixth scale is 459" from the three hundred and fifth. The three hundred and seventh scale is 460½" from the three hundred and sixth. The three hundred and eighth scale is 462" from the three hundred and seventh. The three hundred and ninth scale is 463½" from the three hundred and eighth. The three hundred and tenth scale is 465" from the three hundred and ninth. The three hundred and eleventh scale is 466½" from the three hundred and tenth. The three hundred and twelfth scale is 468" from the three hundred and eleventh. The three hundred and thirteenth scale is 469½" from the three hundred and twelfth. The three hundred and fourteenth scale is 471" from the three hundred and thirteenth. The three hundred and fifteenth scale is 472½" from the three hundred and fourteenth. The three hundred and sixteenth scale is 474" from the three hundred and fifteenth. The three hundred and seventeenth scale is 475½" from the three hundred and sixteenth. The three hundred and eighteenth scale is 477" from the three hundred and seventeenth. The three hundred and nineteenth scale is 478½" from the three hundred and eighteenth. The three hundred and twentieth scale is 480" from the three hundred and nineteenth. The three hundred and twenty-first scale is 481½" from the three hundred and twentieth. The three hundred and twenty-second scale is 483" from the three hundred and twenty-first. The three hundred and twenty-third scale is 484½" from the three hundred and twenty-second. The three hundred and twenty-fourth scale is 486" from the three hundred and twenty-third. The three hundred and twenty-fifth scale is 487½" from the three hundred and twenty-fourth. The three hundred and twenty-sixth scale is 489" from the three hundred and twenty-fifth. The three hundred and twenty-seventh scale is 490½" from the three hundred and twenty-sixth. The three hundred and twenty-eighth scale is 492" from the three hundred and twenty-seventh. The three hundred and twenty-ninth scale is 493½" from the three hundred and twenty-eighth. The three hundred and thirtieth scale is 495" from the three hundred and twenty-ninth. The three hundred and thirty-first scale is 496½" from the three hundred and thirtieth. The three hundred and thirty-second scale is 498" from the three hundred and thirty-first. The three hundred and thirty-third scale is 499½" from the three hundred and thirty-second. The three hundred and thirty-fourth scale is 501" from the three hundred and thirty-third. The three hundred and thirty-fifth scale is 502½" from the three hundred and thirty-fourth. The three hundred and thirty-sixth scale is 504" from the three hundred and thirty-fifth. The three hundred and thirty-seventh scale is 505½" from the three hundred and thirty-sixth. The three hundred and thirty-eighth scale is 507" from the three hundred and thirty-seventh. The three hundred and thirty-ninth scale is 508½" from the three hundred and thirty-eighth. The three hundred and fortieth scale is 510" from the three hundred and thirty-ninth. The three hundred and forty-first scale is 511½" from the three hundred and fortieth. The three hundred and forty-second scale is 513" from the three hundred and forty-first. The three hundred and forty-third scale is 514½" from the three hundred and forty-second. The three hundred and forty-fourth scale is 516" from the three hundred and forty-third. The three hundred and forty-fifth scale is 517½" from the three hundred and forty-fourth. The three hundred and forty-sixth scale is 519" from the three hundred and forty-fifth. The three hundred and forty-seventh scale is 520½" from the three hundred and forty-sixth. The three hundred and forty-eighth scale is 522" from the three hundred and forty-seventh. The three hundred and forty-ninth scale is 523½" from the three hundred and forty-eighth. The three hundred and fiftieth scale is 525" from the three hundred and forty-ninth. The three hundred and fifty-first scale is 526½" from the three hundred and fiftieth. The three hundred and fifty-second scale is 528" from the three hundred and fifty-first. The three hundred and fifty-third scale is 529½" from the three hundred and fifty-second. The three hundred and fifty-fourth scale is 531" from the three hundred and fifty-third. The three hundred and fifty-fifth scale is 532½" from the three hundred and fifty-fourth. The three hundred and fifty-sixth scale is 534" from the three hundred and fifty-fifth. The three hundred and fifty-seventh scale is 535½" from the three hundred and fifty-sixth. The three hundred and fifty-eighth scale is 537" from the three hundred and fifty-seventh. The three hundred and fifty-ninth scale is 538½" from the three hundred and fifty-eighth. The three hundred and sixtieth scale is 540" from the three hundred and fifty-ninth. The three hundred and sixty-first scale is 541½" from the three hundred and sixtieth. The three hundred and sixty-second scale is 543" from the three hundred and sixty-first. The three hundred and sixty-third scale is 544½" from the three hundred and sixty-second. 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The three hundred and seventy-fifth scale is 562½" from the three hundred and seventy-fourth. The three hundred and seventy-sixth scale is 564" from the three hundred and seventy-fifth. The three hundred and seventy-seventh scale is 565½" from the three hundred and seventy-sixth. The three hundred and seventy-eighth scale is 567" from the three hundred and seventy-seventh. The three hundred and seventy-ninth scale is 568½" from the three hundred and seventy-eighth. The three hundred and eightieth scale is 570" from the three hundred and seventy-ninth. The three hundred and eighty-first scale is 571½" from the three hundred and eightieth. The three hundred and eighty-second scale is 573" from the three hundred and eighty-first. The three hundred and eighty-third scale is 574½" from the three hundred and eighty-second. The three hundred and eighty-fourth scale is 576" from the three hundred and eighty-third. The three hundred and eighty-fifth scale is 577½" from the three hundred and eighty-fourth. The three hundred and eighty-sixth scale is 579" from the three hundred and eighty-fifth. The three hundred and eighty-seventh scale is 580½" from the three hundred and eighty-sixth. The three hundred and eighty-eighth scale is 582" from the three hundred and eighty-seventh. The three hundred and eighty-ninth scale is 583½" from the three hundred and eighty-eighth. The three hundred and ninetieth scale is 585" from the three hundred and eighty-ninth. The three hundred and ninety-first scale is 586½" from the three hundred and ninetieth. The three hundred and ninety-second scale is 588" from the three hundred and ninety-first. The three hundred and ninety-third scale is 589½" from the three hundred and ninety-second. The three hundred and ninety-fourth scale is 591" from the three hundred and ninety-third. The three hundred and ninety-fifth scale is 592½" from the three hundred and ninety-fourth. The three hundred and ninety-sixth scale is 594" from the three hundred and ninety-fifth. The three hundred and ninety-seventh scale is 595½" from the three hundred and ninety-sixth. The three hundred and ninety-eighth scale is 597" from the three hundred and ninety-seventh. The three hundred and ninety-ninth scale is 598½" from the three hundred and ninety-eighth. The four hundredth scale is 600" from the three hundred and ninety-ninth. The four hundred and first scale is 601½" from the four hundredth. The four hundred and second scale is 603" from the four hundred and first. The four hundred and third scale is 604½" from the four hundred and second. The four hundred and fourth scale is 606" from the four hundred and third. The four hundred and fifth scale is 607½" from the four hundred and fourth. The four hundred and sixth scale is 609" from the four hundred and fifth. 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The four hundred and nineteenth scale is 628½" from the four hundred and eighteenth. The four hundred and twentieth scale is 630" from the four hundred and nineteenth. The four hundred and twenty-first scale is 631½" from the four hundred and twentieth. The four hundred and twenty-second scale is 633" from the four hundred and twenty-first. The four hundred and twenty-third scale is 634½" from the four hundred and twenty-second. The four hundred and twenty-fourth scale is 636" from the four hundred and twenty-third. The four hundred and twenty-fifth scale is 637½" from the four hundred and twenty-fourth. The four hundred and twenty-sixth scale is 639" from the four hundred and twenty-fifth. The four hundred and twenty-seventh scale is 640½" from the four hundred and twenty-sixth. The four hundred and twenty-eighth scale is 642" from the four hundred and twenty-seventh. The four hundred and twenty-ninth scale is 643½" from the four hundred and twenty-eighth. The four hundred and thirtieth scale is 645" from the four hundred and twenty-ninth. The four hundred and thirty-first scale is 646½" from the four hundred and thirtieth. The four hundred and thirty-second scale is 648" from the four hundred and thirty-first. The four hundred and thirty-third scale is 649½" from the four hundred and thirty-second. The four hundred and thirty-fourth scale is 651" from the four hundred and thirty-third. The four hundred and thirty-fifth scale is 652½" from the four hundred and thirty-fourth. The four hundred and thirty-sixth scale is 654" from the four hundred and thirty-fifth. The four hundred and thirty-seventh scale is 655½" from the four hundred and thirty-sixth. The four hundred and thirty-eighth scale is 657" from the four hundred and thirty-seventh. The four hundred and thirty-ninth scale is 658½" from the four hundred and thirty-eighth. The four hundred and fortieth scale is 660" from the four hundred and thirty-ninth. The four hundred and forty-first scale is 661½" from the four hundred and fortieth. The four hundred and forty-second scale is 663" from the four hundred and forty-first. The four hundred and forty-third scale is 664½" from the four hundred and forty-second. The four hundred and forty-fourth scale is 666" from the four hundred and forty-third. The four hundred and forty-fifth scale is 667½" from the four hundred and forty-fourth. The four hundred and forty-sixth scale is 669" from the four hundred and forty-fifth. The four hundred and forty-seventh scale is 670½" from the four hundred and forty-sixth. The four hundred and forty-eighth scale is 672" from the four hundred and forty-seventh. The four hundred and forty-ninth scale is 673½" from the four hundred and forty-eighth. The four hundred and fiftieth scale is 675" from the four hundred and forty-ninth. The four hundred and fifty-first scale is 676½" from the four hundred and fiftieth. 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The five hundred and twentieth scale is 780" from the five hundred and nineteenth. The five hundred and twenty-first scale is 781½" from the five hundred and twentieth. The five hundred and twenty-second scale is 783" from the five hundred and twenty-first. The five hundred and twenty-third scale is 784½" from the five hundred and twenty-second. The five hundred and twenty-fourth scale is 786" from the five hundred and twenty-third. The five hundred and twenty-fifth scale is 787½" from the five hundred and twenty-fourth. The five hundred and twenty-sixth scale is 789" from the five hundred and twenty-fifth. The five hundred and twenty-seventh scale is 790½" from the five hundred and twenty-sixth. The five hundred and twenty-eighth scale is 792" from the five hundred and twenty-seventh. The five hundred and twenty-ninth scale is 793½" from the five hundred and twenty-eighth. The five hundred and thirtieth scale is 795" from the five hundred and twenty-ninth. 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Mike Hardiman investigates another aspect of the State Railways of Thailand as part of a continuing effort to market recent operations in 7¼in (known scale or 45mm gauge track).

Diesel shunters

Second generation machine proves worth to the factory

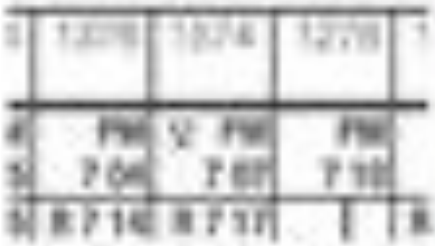
Above
Another view of the same locomotive, showing the cab and bonnet to good advantage.

Centre
Another view of the locomotive, showing the cab and bonnet to good advantage.

Below
Another view of the locomotive, showing the cab and bonnet to good advantage.

END OF THE LINE FOR METRO-NORTH BAR CARS

The Last Call



Cafe Car

Kraft. The hamburger served up seven big cuts of the best cuts and combined to the grind. One of the core recipes and method originating the company's 1980's establishment making, smiles, memories, and extravagant entertainment took place throughout the big movie floor to Sandstone. ABOVE: Despite the cooler temperatures, the atmosphere remained hot with excitement as crowds entered one of the convention through and the evening. Arrive on immediate interest.

profitability, more one of the first one-week events ran Mortal World, ordering operations of $500,000 per year in recent years.

Robert Pickering, an interior designer, got a bit sentimental before setting off the event in Ryan Riverside. "That's the beauty of the fair run, you don't need to know when you will just see how the audience walks as an entertainment." She may mention something she stopped off the lines and stayed good tips to the crowds for the two days.

Other comments were less open-ended of the core "Life happens." Ivan heard from Jeanne Dube, of Old Greenwich, Conn. Barry Burke created to be saying "It belongs to mention one just like the old trains long years and then." Another explains of an earlier case. My father used to visit the store-two-owned back to the 1950s, where they would walk your drinks to your seat, and where you could enjoy a small breakfast and a glass of orange juice and some coffee on the morning newspaper," offered Joe Barbera, a senior writer for CBS from Darien, Conn. "I've been an these cars for 30 years, and I think it's an entertainment that you can't keep the same secret so part of taking these trains apart," he added. Presenting seats to Jose, Bob Gallego, a bus director from West Haven, Conn., walked with agreement and added "It's not a hobby of ours or

board female people, who have developed a certain cachet among club-savvy riders. We have only one such rider on the train, but others are in all cars, so no fear here.

The train arrived at Bakersfield amid a large gaggle of the partying set off, to the dismay of the rookies. The dancers, rail buffs, and blues aficionados were unaffected. The bar car was busy wrapping down as the music spun across the Central Valley night. At 9:10 p.m., the locomotive changed out "Last call!" for the final time as the train pulled out of Bakersfield Metro station. While the bartender cleaned up numerous bottles and bottles and continued cash box count, weather listings announce the last bit of business. The regulars on the train could not help but celebrate each other's much deserved drink prices and cut a swell path in the rocky environment our train was.

At 9:30 p.m., the last drink was served in cash and tickets purchased for the earliest arrivals for onward journeys as of sunrise. At 9:35, the locomotive stopped off at Bakersfield, leaving an empty space behind the bar for the to-morning 10 miles to Santa Monica.

Upon arrival in San Diego, Ms. [illegible] was brought into the cool car that then Pete Dyer, an San Juan Capistrano, to Prosser's young yard in Fresno, Ohio. After 30 years of train

DES PLAINES HOBBIES

1. Huntington Junction is a signature scene on Bob Gurley's HO scale Boston & Maine. Bob established this station and many other structures on the layout.

Steam-to-diesel on the BOSTON & MAINE

Bob Gurley's 22 × 50 foot HO scale layout models the transition era in northern New England

By Mike Confalone • Photos by the author

Modeling New England railroads seems instantly to Bob Gurley. Growing up in Lynn, Mass., only an hour's drive to Boston's B&M yard, Bob was fascinated by the fast steam locomotives on the line, as well as colorful first-generation diesels. It's no surprise that the B&M's steamers so influence his model railroading efforts now when a central role in his 22 × 50 foot HO scale layout, which can certainly be thought of as northern New England in miniature.

As a teenager with limited funds, Bob's early model railroading efforts included wheel-wash layouts. Typical for their time, these layouts had track with brass rails and then (on the model plot behind his dad's house) a locomotive and rolling stock.

Although he maintained a casual interest in model railroading throughout his life, Bob left the hobby for years here as an adult. Back in the mid-'90s, he was looking for something to build and spotted a copy of Model Railroader. Newly inspired, he returned to the hobby and began work on his present layout.

The layout's track plan is loosely based on the Boston & Maine's Worcester Branch from Ayer Junction, N.H., to Portsmouth, N.H., and a portion of the B&M's main line in Portland, Maine. Beginning in a small layout under the basement stairs, Bob's B&M has expanded significantly over the years. The layout now occupies most of the basement under the house and garage. The track plan was implemented with Atlas code 100 flex track and Atlas #6 turnouts. Bob's DCC system is a Digitrax Zephyr.

Building the B&M

Since he's a carpenter by trade, Bob's first priority was to frame his basement with 2 × 4 studs and 2 × 6 joists. He then covered the walls with 4 × 8 foot sheets of ½-inch foam insulation board. Bob used 1 × 4 pine boards to create the benchwork, which he supported with 2 × 4 legs. He then covered the benchwork with ¾-inch plywood.

Bob's layout is a point-to-point railroad, with staging tracks at each end. Trains run from Ayer Junction to Portsmouth, and then back to Ayer Junction. Bob's staging tracks are hidden behind a backdrop that represents the Portsmouth waterfront.

A 4-ton all-T-series hauls a freight train into Manchester Park, an 1,800-sq.-ft. scene in the Hob. Bob's shift at work/childbuilding wood storehouse is evident in the prototype-based B&M interlocking tower

On tracked the roads, installed ballast, and added a finished roofing. He also installed electrical cables around the room before beginning layout construction.

He turned benchwork to open grid and 1- grades with 1- threaded railroad-tied grid. Bob says Proto:87 code 100 flextrack, but that switched to the Shinohara code 100 Bronco, but that switched to the Shinohara code 83 and code 70 turnouts. He installed electrical frogs, making the DCC's setting. Bob also installed Shinohara horizontal-style 1 throw motorized ground throws for short manual control.

Originally, Bob wired the layout for direct-current (DC) block control using two power packs. Several years ago Bob converted his entire layout to Digital Command Control (DCC) using a Digitrax DH 1 system. He also installed SoundTraxx sound decoders in several of his steam and diesel locomotives.

Realistic scenery

Building scenery is one of Bob's favorite aspects of the hobby. He uses

A 1940s construction on the time of the writing, the Portland Maine section will feature several large industries. The construction Grand Trunk Ry. grain elevator (the white structure in the center) is taking shape. Back also construction two B&M Maine buildings on the right.

The layout at a glance

Name: Boston & Maine
Scale: HO (1:87)
Size: 22 x 10 feet
Prototype: loosely based on Boston & Maine, Maine Central, and Grand Trunk Ry.
Locale: New Hampshire and Maine
Era: 1st 1950
Style: small to
Mainline run: 118 feet
Minimum radius: 24"
Maximum grade: less than 1 percent
Height: 52"
Benchwork: 1/2" plyw
Trains: Diesel-era power, fit and color of the era
Scenery: plaster over screen
Backdrop: painted drywall with some photo backdrops
Control: Digitrax DCC

model railroading pioneer Allen Miller in his present collection.

Bob starts scenery work by applying base backdrops from plaster over screen wire. After letting the plaster dry, he paints it with a coat of earth-tone latex paint. Then he applies ground cover using Woodland Scenics such as cork or turf mat, and the panel roads are made with wine components.

Most of the trees on the layout are made of natural commercial plant that Bob's wife, Charlotte, grows in their yard. Once dried, the plant branches make realistic looking HO scale tree armatures. After painting the armatures, Bob applies Woodland Scenics foliage in autumn colors. For a slightly different look, Bob also uses dried pieces of tea from his own tea plantation.

He builds trees using Scenic Cut. Like real plant stems, before applying the spray he paints the branches with dark colors to simulate depth and add details such as knots and bark.

4 Surrounded by colourful fall foliage, Brunton & Milano GP7 no. 1570 leads a local along the Portsmouth Branch. Bob made the omissions he felt realistic ones from driver blackberry bush and sunbush.

Scratchbuilt structures

Many are drawn today to scratchbuilt structures on the layout and would-be modelers may be attracted to the challenge of fabricating a new complex structure or the joy found in duplicating a specific prototype subject. Both can be a positive for scratchbuilding, and dozens of structures found on the prototype Maine. The mill is a scratchbuilt structure on the layout was the three-mill warehouse in Portsmouth. The largest structure on the layout will be the Grand Trunk Rv grain elevator in Portland. Other key structures (which are single stations in Manchester, Penn Yennik, and Rockingham Junction).

The crossing of the Manchester to Portsmouth Branch and the Main main line in Portland, Rockingham Junction is a significant scene on the layout. It's based on a prototypical location near Nashville, N.H. Another favorite scene on Bob's is the branch that runs over Hannah Reservoir, N.H., and the rear of the layout's penthouse. Along with many New England scenery, this area features a watercolor-like of scratchbuilt structures, including a coal and fuel dealer, and a Wood's Company.

5 A Manchester Locomotive Works class G-14b 2-8-0, GMRR no. 414, overlooks the mill yard seen in Bob's Manchester. For the buildings, Bob used photos of the prototype old buildings that still stand in Manchester, N.H.

In addition to the Manchester and Main, Bob used a high overhead photo of Jamestown mill buildings as the backdrop. Bob plans to add photo backdrops to other scenes as time permits.

Sharing the railroad

Although the layout is designed for point-to-point operation, the menu line is a continuous run. This is especially helpful when Bob hosts meets.

A. At Hopkinton, N.H., 2009 (p. 1939) stops a hopper at the coal dealer across the street from the depot's trackwork done, the engine crews will go for lunch at Red's Diner seen on the right foreground of the photo.

A. At Portsmouth, the 1924's cozy blue RS-3 works the yard. Bob scrambleds the wood reading lower for the yard's engine terminal.

About Bob Easley

A carpenter by trade, Bob Easley lives in Goffstown, N.H., with his wife, Claudette. They have five children and nine grandchildren. In addition to model railroading, Bob enjoys camping, kayaking, and motorcycling.

Each year Bob participates in the New Hampshire Invasion from the Lincolnville, a self-guided tour of two of model railroads. During the event, Bob opens his layout to the public. Despite the tight confines of his home layout, he entertains hundreds with enthusiastic visitors over the two Invasion weekends.

Bob doesn't have formal operating sessions, but this was changed on the second layout's completion. He has dozens of modeling tasks to keep him busy on the layout as work on the Portland, Maine, expansion continues. Additional waterfront tracks, roads, structures, and scenery still need to be developed.

When building models or running trains, model railroading has given Bob a lifetime of entertainment and will continue as he nd the years to come. RM

Author and photographer Allen Creamer's RR work followed. His was featured in Model Railroad Planning 2012.

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A short introduction to Weathering steam-era freight cars

– By Charlie Duckworth

Easy weathering techniques that make you look like a pro ...

1. A string of weathered freight cars rolls past a stock yard. Charlie Duckworth describes the techniques he used to weather them in this article.

One of my favorite aspects of the model railroad hobby is weathering rolling stock, locomotives, and buildings. Whether it's a plastic model in the out-of-the-box factory paint, or a resin model I've just painted and decaled, it just doesn't look right until I've taken a few steps to make it look like it's been in service. Here's how I weather my freight cars.

I always work from a photograph of a car to help me stay within a weathering boundary. It's easy to get carried away and

find you've over-weathered a car. My favorite source is the many period freight car photos in railroad historical society magazines, websites (cariverrailroads.com/freight_car.html), or books such as "Railway Prototype Cyclopedia," "Refrigerator Car Color Guide" by Gene Green, or "The Postwar Freight Car Fleet" by Larry Kline and Ted Culotta.

ExactRail's B&O wagon top boxcar

2. This began with an Exact Rail B&O M53 boxcar. This model has its original factory paint scheme. To age the car, I sprayed it lightly with Dullcote mixed with a few drops of boxcar red and black. This does a couple of things to the model: 1) it blends the starkness of the white lettering in with the car, and 2) the flat finish gives the surface some "tooth" for using dry pigments and pencils. After the Dullcote dried, I used brown and black MIG pigments along the car's vertical ribs where

industrial dust and coal smoke naturally collect. MIG pigments have an adhesive ground-in with the colored pigments, and they won't come off during normal handling. I then used an old paint brush to apply some black pigment underneath the running board, where coal dust would collect. Finally, I used a white pencil to add the switch foreman's or conductor's switching instructions.

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Westerfield rebuilt Texas & Pacific boxcar

3. As with the B&O wagon top car, this T&P model was finished using MIG pigments. I dipped a small brush in the brown pigment, and ran it vertically over the seams. In addition to the brown, a "mid-east dust" pigment was used to weather the trucks and lower body ends. The final step is to use some of the black to weather around the running boards where soot and grime collects. Go lightly on using the MIG pigments – they don't come off easily as chalk pigments do.

Funaro & Camerlengo Pennsylvania X26c rebuild boxcar

4. I wanted to show this car in heavy use from a Northeast industrial area, so I painted it an oxide red, and decaled it using Jerry Glow's jerryglow/decals/full.html decal set. After the decals were dry, I weathered the vertical seams and the lower panels with black oil paint. The area below the car sides was given more black oils to increase the shadows and add dirt and grime where they naturally collect.

Reweighs

5. Due to wear on the freight cars and changes made during shoppings. AAR Car Service Rule 11 mandated that new composite wood and steel underframe and all steel boxcars were to be reweighed after the first 15 months in service, with subsequent reweighing every 48 months. New open-top cars and covered hoppers were reweighed after the first 30 months in service, and every 30 months for subsequent light weighing. New refrigerator cars, all-steel flatcars, all-steel house and steel stock cars were to be light-weighed 30 months after the initial weighing, and 48 months for all subsequent weighing. (from the January 1956 "ORER.")

The rule also reads, in section F, paragraph 30, "When cars are re-stenciled after re-weighing, all old stenciling to be renewed must be obliterated with

quick-drying paint. It will be necessary only to re-new all light-weight numerals, station symbol, date (month, year), and load limit numerals.....The capacity numerals and letters 'CAPY,' 'LD LMT,' and 'LT WT' when indistinct, must be renewed....."

To show this car was recently weighed, I added a patch of freight car-red paint over the original load-limit and light-weight stenciling and re-decaled newer information. "P283" is the code for weigh station on the Pennsylvania Railroad ,and "1-50" was the month and year the car was weighed.

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Accurail's CN boxcar

6. This "out-of-the-box" Accurail Canadian National boxcar illustrates where I used a small amount of white oil paint around the lower part of the doors to denote where flour bags broke and spilled during transit, or while loading or unloading. You see this on a few freight cars in a consist, and it adds a little variety to a cut of cars. I upgraded the model to match my resin cars by replacing the cast-on grab irons and ladders with wire and plastic ones.

Intermountain Union Pacific 1937 boxcar

7. Here's another example of a Union Pacific car that's been loaded around a flour mill. As with the PRR box-car, a small red patch was added, and a new light weight, weighing station and date were added. The car was weathered using white oil paint to show heavy loading around a flour mill. After the paint was dry, I gave the car a light coat of Dullcote.

Rocket Express 50' automobile boxcar

8. This RI car was finished using Dullcote with a couple of drops of boxcar red added as a tint. The car was then given a light dusting of brown pigments, and sprayed again with a light coat of Dullcote. At some point in its career the car was removed from automobile service, so the horizontal boxcar red patch on the right side of the car that denotes the original "AUTOMOBILE" lettering was painted-out by the Rock Island RIP track workers.

Accurail's Rock Island USRA boxcar

9-10. Accurail did a great job of capturing the lettering on this car. In addition to weathering the car, I removed all the cast-on grab irons and replaced them with wire ones. I then airbrushed the handhold areas with a BCR that matched the factory paint. Next was to over-spray the car with a light Dullcote mixed with a few drops

of black and dust to tone-down the lettering. I then used black and light brown colored pencils to lightly highlight some of the vertical boards on the sides and doors for additional weathering. The prototype roof was painted with black roof cement, so I used a mix of black and white oil paints to denote a weathered roof with some of the roof cement flaking off.

Accurail wood reefer

11. This model was repainted and decaled with the Microscale decal set for BFEX reefers. The molded-on grab irons and ladders were replaced with wire and plastic ones. The car was finished by over-spraying it with a Dullcote mixed with a couple of drops of black and brown to tone down the sides. After the Dullcote was dry a new #11 X-Acto blade was used to remove some of the Dullcote mixture around the grab irons and ladders, where trainmen would have climbed on the car. A few individual boards were also picked out with the X-Acto blade to age the car sides more.

White and yellow pencils

The best white pencil for adding chalk marks is made by Prismacolor; the number on the pencil is PC938. To be honest, the yellow pencils don't do a great job, and you could skip them all together. The important thing is to weather some of the white pencil marks to age them, and have some contrast to new marks. I use white and yellow pencils where a conductor, engine foreman, carman made chalk marks on a steam-era car. Look at vintage freight car photos to see the variety of numbers and letters used by different railroads. Put one on, and gently rub it off, then add another next to it, to show the aging process.

Oil paints

I use mostly black and brown to denote oil and grease. Mix a little with mineral spirits and dab around the journal boxes to show where the carman added oil. I also put some on the door latches and along the lower door guide where a carman would have greased these areas.

Conclusion

I hope this short introduction into weathering inspires you to get started on your fleet. The techniques I use are very easy, they just take a bit of practice. In no time at all you can weather your cars like a pro. So jump in and get started.

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Reader Feedback

Charlie Duckworth retired from Union Pacific after 38 years. He started with the Missouri Pacific in 1974. Charlie has sent ten articles for Mainline Modeler Model Railroader and Model Railroad Hobbyist. He has a Yahoo Group (Mopac Bagnell Branch) where you can subscribe and see photos of his layout and read about his latest resin freight car or building additions.

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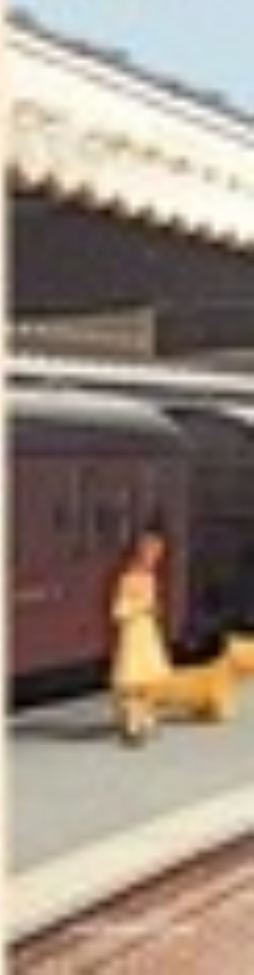
Not quite the Channel Tunnel!

Plans for layouts without an hidden yard – 2

In the second of his series on layouts without hidden yards, **[illegible]** shows how two combined sub-platform suites in and digital scaling his new layout, with each installed underneath the fiddle yard. On the other hand, with each set he is not always one know of course there are both at the British railway terminus, Victoria Town, set in East Yorkshire.

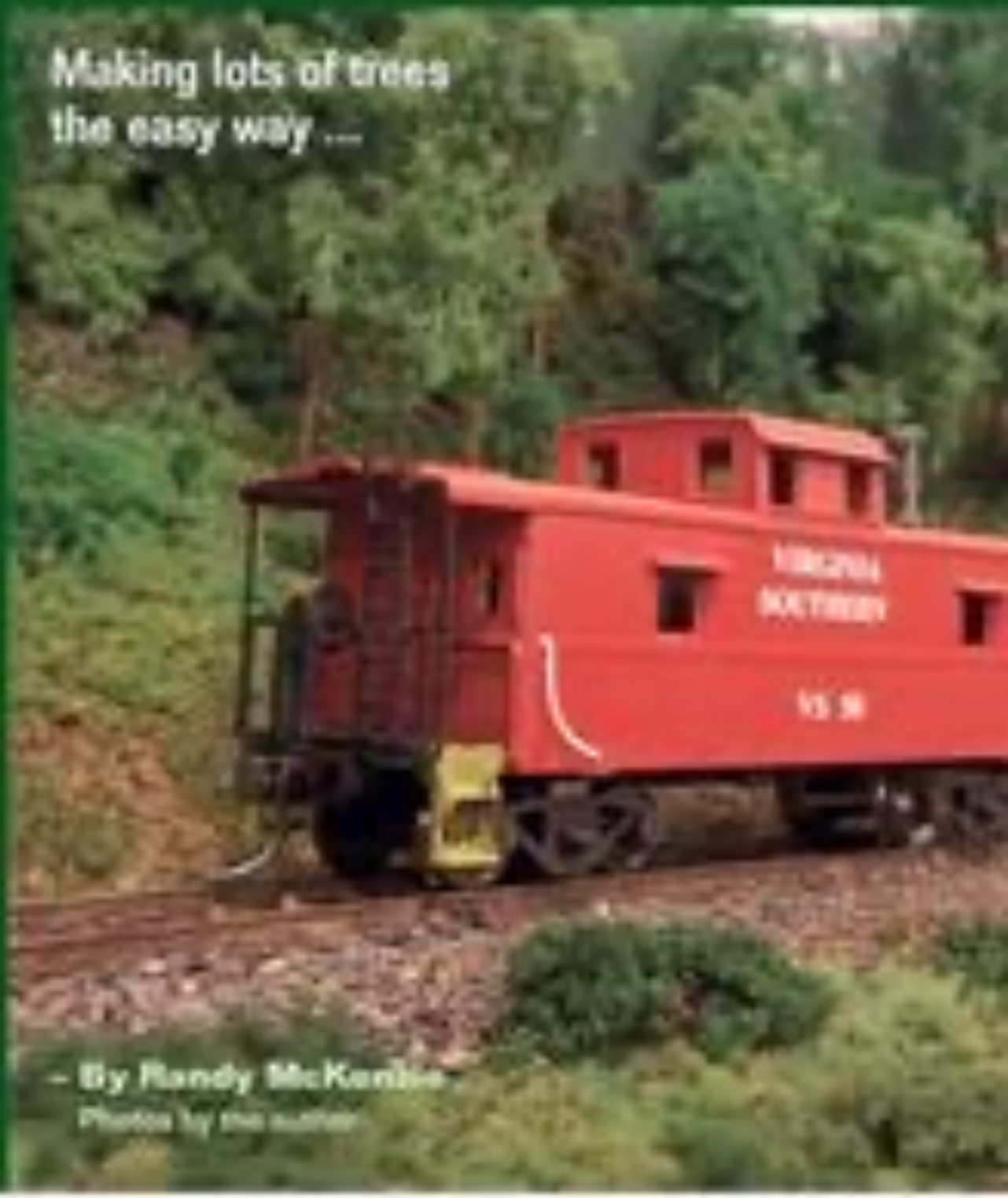


"Greens and drushers" - John Allen

Roundtrees Sidings pt.2

Fast and Easy

TREES



Covering a layout with thousands of trees normally comes down to very few choices: Puff balls, kits, or Super Trees. I needed a better option for my HO triple-deck Virginia Southern. My solution is easy, fast, and cheap. I call them "Secondary trees," meaning they are not as detailed as Super Trees, but give a transition between front-row trees and puff balls in the distance.

Let's get started.

1. Virginia Southern caboose VS 59 tags along at the end of an empty coal train as it heads through the lush green forests of Virginia.

Reader Feedback

STEP 1: Collecting the materials

Materials needed

- Queen Anne's Lace or any other dried weed stem
- Side cutters
- Bailing twine or small sisal twine.
- Foam blocks
- Fine ground foam, various colors
- Spray paint, Kelly green
- Rubber cement or Aleene's Tacky Glue

2. Queen Anne's lace forms the base of the trees. The great thing is, it's free. Just go out and collect it. Allow it to dry about two weeks. Begin by clipping off the head of the weed.

STEP 2: Preparing the materials

3. Start clipping the weed stem into trunks of various lengths. I use a container to hold the trunks until I am ready to use them.

4. Here are a selection of trunks I cut to various lengths.

The entire weed stem can be used, the forked branch as well as the straight trunk.

STEP 2: Preparing the materials Continued...

5. Prepare the twine by cutting it into lengths between ¼" to ¾" long for N and HO scale. I cut and mix the random lengths in a plastic container. The twine will normally unwind when it is cut; if not, roll it between your fingers to get the individual strands.

The key is to have a random mix of twine lengths. This creates the uneven branch structure of the tree.

STEP 3: Gluing the twine to the trunks

6. Give the top section of trunk a coat of rubber cement. I coat about two-thirds of the stem. Tacky Glue can also be used.

7. This is what the trees should look like with the twine applied to the trunks. Sprinkle the cut twine over the wet glue. I work in batches of six to 15 trees. I use a foam block as a palette to hold the trunks between steps. This also makes an easy way to carry the trees to the layout for planting. At this point they don't look great, but the next step is the MAGIC.

STEP 3: Gluing the twine to the trunks Continued ....

8. Here are a group of trees ready for foam.

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STEP 4: Adding the foam

9. These are the adhesives I use: Spray adhesive, 3M General Purpose 45, Rubber cement or Tacky Glue.

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STEP 4: Adding the foam Continued ...

10. Give the trunk and twine a light coat of green paint. Next spray adhesive, until the twine is covered. With practice, you know how much adhesive is required. Not enough, and the foliage will be too thin; too much, and it will look more like a green corn dog.

Sprinkle green ground foam onto the glue. Tap the tree to knock off the loose material. If the twine is still exposed, sprinkle on more.

STEP 4: Adding the foam Continued ...

11. Rotate the trunk, and sprinkle foam on the other side. Repeat the steps in (10).

STEP 4: Adding the foam Continued ...

12. You now have a tree ... With materials ready, you should be able to turn out a tree in about 30 to 45 seconds. I use several colors of foam, and plant the trees in random mixes of colors and sizes.

STEP 5: Planting the trees

13. Start in the back and work your way forward. Random spacing along with varying heights will create a very natural-looking mountain of trees. Secure the trunk of the tree in place with white glue.

STEP 5: Planting the trees Continued ...

14. A group of trees waiting to be planted near Crabtree Tipple on my layout.

15. A finished section of my layout filled with the fast and easy trees.

Randy McKenzie cannot remember a time he didn't love trains. After building his home in 2003, he started his Virginia Southern in June 2004 and filled his 32x38 area with a triple-deck HO layout. The VS is a proto-freelance merger of the Clinchfield and Interstate Railroads, modeling Elkhorn City KY to Kingsport TN.

Randy works as an electronic communications technician for the Virginia State Police, serves as a Cub Master and Assistant Scout Master in the Boy Scout program, enjoys fishing, camping, and amateur radio. He is married with two children who also share in building the layout.

You can see more of the Virginia Southern Model Railroad on Facebook (facebook.com/groups/485922874770332/).

Reader Feedback

Through the railway room door

Portwen and Hope

One in a series of on the work of **RAILWAY MODELS** readers for model railways were started as a small boy, but it wasn't until later in life that he realised his dream of building a model railway. The subject was 4 gauge layout in the west.

Creating a radio-controlled railbus

Scratchbuilding the "Tin Lizard"

By Roy H. Granadino III

1. A good truck model provides the power for the vehicle. Miniatures are commercial products. The frame is made of aluminum.

2. Tamiya's gear box measures seven inches in overall length. Gearing, propeller speed, were unchanged.

3. The body is a fiberglass design that is typical of trucks and caravans of this category. The frame came from the same kit as the tractor.

4. The compact electronics and battery pack are concealed under the body and chassis.

5. Brass rod and angles, soldered together, form the pylon.

While I own 3 scratch-built models, I have always had great respect for those who can produce a model from scratch. Although I have a fairly good idea of how I want my models to look, I am not a very good draftsman. I have always had difficulty in translating my ideas into a workable drawing. Therefore, I usually start my projects with a set of plans that I purchase from a hobby shop. Then I modify the plans to suit my own ideas.

The plans for the Peterbilt truck and trailer that I built were purchased from the Aero Enterprises, Inc. of Phoenix, Arizona. The model is designed to be powered by a single electric motor. The plans call for a 1/4" scale model, but I decided to build it 1/8" scale. This would make the model twice as large and would allow me to install a more powerful motor and a radio control system.

I ordered the plans and began to study them. I decided that I would have to make some changes in the design. The plans called for a single rear axle. I wanted to have a tandem rear axle. I also wanted to have a sleeper cab. The plans did not show a sleeper cab, but I felt that I could design one that would look good on the truck. I also wanted to have a detailed engine compartment. The plans did not show any detail in the engine compartment, but I felt that I could add some detail to make it look more realistic.

I began by building the chassis. I used 1/4" square aluminum tubing for the frame rails. I cut the tubing to the proper length and then drilled holes for the various components. I used 1/4" aluminum angle for the cross members. I drilled holes in the angle and then bolted the cross members to the frame rails. I used 1/4" bolts and nuts to fasten the cross members to the frame rails.

I built the front axle assembly from scratch. I used 1/4" aluminum tubing for the axle housing. I drilled holes in the ends of the tubing and then bolted the spindles to the ends of the tubing. I used 1/4" bolts and nuts to fasten the spindles to the axle housing. I used 1/4" aluminum angle for the steering arms. I drilled holes in the steering arms and then bolted the steering arms to the spindles. I used 1/4" bolts and nuts to fasten the steering arms to the spindles.

I built the rear axle assembly from scratch. I used 1/4" aluminum tubing for the axle housing. I drilled holes in the ends of the tubing and then bolted the wheels to the ends of the tubing. I used 1/4" bolts and nuts to fasten the wheels to the axle housing. I used 1/4" aluminum angle for the suspension arms. I drilled holes in the suspension arms and then bolted the suspension arms to the axle housing. I used 1/4" bolts and nuts to fasten the suspension arms to the axle housing.

I built the sleeper cab from scratch. I used 1/4" aluminum angle for the cab frame. I drilled holes in the cab frame and then bolted the cab frame to the chassis. I used 1/4" bolts and nuts to fasten the cab frame to the chassis. I used 1/4" aluminum angle for the cab roof. I drilled holes in the cab roof and then bolted the cab roof to the cab frame. I used 1/4" bolts and nuts to fasten the cab roof to the cab frame.

I built the engine compartment from scratch. I used 1/4" aluminum angle for the engine compartment frame. I drilled holes in the engine compartment frame and then bolted the engine compartment frame to the chassis. I used 1/4" bolts and nuts to fasten the engine compartment frame to the chassis. I used 1/4" aluminum angle for the engine compartment roof. I drilled holes in the engine compartment roof and then bolted the engine compartment roof to the engine compartment frame. I used 1/4" bolts and nuts to fasten the engine compartment roof to the engine compartment frame.

I built the fuel tanks from scratch. I used 1/4" aluminum angle for the fuel tank frame. I drilled holes in the fuel tank frame and then bolted the fuel tanks to the chassis. I used 1/4" bolts and nuts to fasten the fuel tanks to the chassis. I used 1/4" aluminum angle for the fuel tank straps. I drilled holes in the fuel tank straps and then bolted the fuel tank straps to the fuel tanks. I used 1/4" bolts and nuts to fasten the fuel tank straps to the fuel tanks.

I built the exhaust system from scratch. I used 1/4" aluminum tubing for the exhaust pipes. I drilled holes in the exhaust pipes and then bolted the exhaust pipes to the engine compartment frame. I used 1/4" bolts and nuts to fasten the exhaust pipes to the engine compartment frame. I used 1/4" aluminum angle for the exhaust pipe supports. I drilled holes in the exhaust pipe supports and then bolted the exhaust pipe supports to the chassis. I used 1/4" bolts and nuts to fasten the exhaust pipe supports to the chassis.

I built the air tanks from scratch. I used 1/4" aluminum angle for the air tank frame. I drilled holes in the air tank frame and then bolted the air tanks to the chassis. I used 1/4" bolts and nuts to fasten the air tanks to the chassis. I used 1/4" aluminum angle for the air tank straps. I drilled holes in the air tank straps and then bolted the air tank straps to the air tanks. I used 1/4" bolts and nuts to fasten the air tank straps to the air tanks.

I built the battery box from scratch. I used 1/4" aluminum angle for the battery box frame. I drilled holes in the battery box frame and then bolted the battery box to the chassis. I used 1/4" bolts and nuts to fasten the battery box to the chassis. I used 1/4" aluminum angle for the battery box lid. I drilled holes in the battery box lid and then bolted the battery box lid to the battery box. I used 1/4" bolts and nuts to fasten the battery box lid to the battery box.

I built the tool box from scratch. I used 1/4" aluminum angle for the tool box frame. I drilled holes in the tool box frame and then bolted the tool box to the chassis. I used 1/4" bolts and nuts to fasten the tool box to the chassis. I used 1/4" aluminum angle for the tool box lid. I drilled holes in the tool box lid and then bolted the tool box lid to the tool box. I used 1/4" bolts and nuts to fasten the tool box lid to the tool box.

I built the fifth wheel from scratch. I used 1/4" aluminum angle for the fifth wheel frame. I drilled holes in the fifth wheel frame and then bolted the fifth wheel to the chassis. I used 1/4" bolts and nuts to fasten the fifth wheel to the chassis. I used 1/4" aluminum angle for the fifth wheel plate. I drilled holes in the fifth wheel plate and then bolted the fifth wheel plate to the fifth wheel. I used 1/4" bolts and nuts to fasten the fifth wheel plate to the fifth wheel.

I built the trailer from scratch. I used 1/4" aluminum angle for the trailer frame. I drilled holes in the trailer frame and then bolted the trailer to the chassis. I used 1/4" bolts and nuts to fasten the trailer to the chassis. I used 1/4" aluminum angle for the trailer axle. I drilled holes in the trailer axle and then bolted the trailer axle to the trailer frame. I used 1/4" bolts and nuts to fasten the trailer axle to the trailer frame.

I built the trailer wheels from scratch. I used 1/4" aluminum angle for the trailer wheel frame. I drilled holes in the trailer wheel frame and then bolted the trailer wheels to the trailer wheel frame. I used 1/4" bolts and nuts to fasten the trailer wheels to the trailer wheel frame. I used 1/4" aluminum angle for the trailer wheel plate. I drilled holes in the trailer wheel plate and then bolted the trailer wheel plate to the trailer wheel. I used 1/4" bolts and nuts to fasten the trailer wheel plate to the trailer wheel.

I built the trailer tires from scratch. I used 1/4" aluminum angle for the trailer tire frame. I drilled holes in the trailer tire frame and then bolted the trailer tires to the trailer tire frame. I used 1/4" bolts and nuts to fasten the trailer tires to the trailer tire frame. I used 1/4" aluminum angle for the trailer tire plate. I drilled holes in the trailer tire plate and then bolted the trailer tire plate to the trailer tire. I used 1/4" bolts and nuts to fasten the trailer tire plate to the trailer tire.

I built the trailer lights from scratch. I used 1/4" aluminum angle for the trailer light frame. I drilled holes in the trailer light frame and then bolted the trailer lights to the trailer light frame. I used 1/4" bolts and nuts to fasten the trailer lights to the trailer light frame. I used 1/4" aluminum angle for the trailer light plate. I drilled holes in the trailer light plate and then bolted the trailer light plate to the trailer light. I used 1/4" bolts and nuts to fasten the trailer light plate to the trailer light.

I built the trailer mudflaps from scratch. I used 1/4" aluminum angle for the trailer mudflap frame. I drilled holes in the trailer mudflap frame and then bolted the trailer mudflaps to the trailer mudflap frame. I used 1/4" bolts and nuts to fasten the trailer mudflaps to the trailer mudflap frame. I used 1/4" aluminum angle for the trailer mudflap plate. I drilled holes in the trailer mudflap plate and then bolted the trailer mudflap plate to the trailer mudflap. I used 1/4" bolts and nuts to fasten the trailer mudflap plate to the trailer mudflap.

I built the trailer landing gear from scratch. I used 1/4" aluminum angle for the trailer landing gear frame. I drilled holes in the trailer landing gear frame and then bolted the trailer landing gear to the trailer landing gear frame. I used 1/4" bolts and nuts to fasten the trailer landing gear to the trailer landing gear frame. I used 1/4" aluminum angle for the trailer landing gear plate. I drilled holes in the trailer landing gear plate and then bolted the trailer landing gear plate to the trailer landing gear. I used 1/4" bolts and nuts to fasten the trailer landing gear plate to the trailer landing gear.

I built the trailer doors from scratch. I used 1/4" aluminum angle for the trailer door frame. I drilled holes in the trailer door frame and then bolted the trailer doors to the trailer door frame. I used 1/4" bolts and nuts to fasten the trailer doors to the trailer door frame. I used 1/4" aluminum angle for the trailer door plate. I drilled holes in the trailer door plate and then bolted the trailer door plate to the trailer door. I used 1/4" bolts and nuts to fasten the trailer door plate to the trailer door.

I built the trailer roof from scratch. I used 1/4" aluminum angle for the trailer roof frame. I drilled holes in the trailer roof frame and then bolted the trailer roof to the trailer roof frame. I used 1/4" bolts and nuts to fasten the trailer roof to the trailer roof frame. I used 1/4" aluminum angle for the trailer roof plate. I drilled holes in the trailer roof plate and then bolted the trailer roof plate to the trailer roof. I used 1/4" bolts and nuts to fasten the trailer roof plate to the trailer roof.

I built the trailer sides from scratch. I used 1/4" aluminum angle for the trailer side frame. I drilled holes in the trailer side frame and then bolted the trailer sides to the trailer side frame. I used 1/4" bolts and nuts to fasten the trailer sides to the trailer side frame. I used 1/4" aluminum angle for the trailer side plate. I drilled holes in the trailer side plate and then bolted the trailer side plate to the trailer side. I used 1/4" bolts and nuts to fasten the trailer side plate to the trailer side.

I built the trailer rear from scratch. I used 1/4" aluminum angle for the trailer rear frame. I drilled holes in the trailer rear frame and then bolted the trailer rear to the trailer rear frame. I used 1/4" bolts and nuts to fasten the trailer rear to the trailer rear frame. I used 1/4" aluminum angle for the trailer rear plate. I drilled holes in the trailer rear plate and then bolted the trailer rear plate to the trailer rear. I used 1/4" bolts and nuts to fasten the trailer rear plate to the trailer rear.

I built the trailer front from scratch. I used 1/4" aluminum angle for the trailer front frame. I drilled holes in the trailer front frame and then bolted the trailer front to the trailer front frame. I used 1/4" bolts and nuts to fasten the trailer front to the trailer front frame. I used 1/4" aluminum angle for the trailer front plate. I drilled holes in the trailer front plate and then bolted the trailer front plate to the trailer front. I used 1/4" bolts and nuts to fasten the trailer front plate to the trailer front.

I built the trailer floor from scratch. I used 1/4" aluminum angle for the trailer floor frame. I drilled holes in the trailer floor frame and then bolted the trailer floor to the trailer floor frame. I used 1/4" bolts and nuts to fasten the trailer floor to the trailer floor frame. I used 1/4" aluminum angle for the trailer floor plate. I drilled holes in the trailer floor plate and then bolted the trailer floor plate to the trailer floor. I used 1/4" bolts and nuts to fasten the trailer floor plate to the trailer floor

ng was used to construct the body of the bodies. I soldered the end of a wire to the roof strip, then cut it off and formed the ladder. It is held on the rig in either the end strip. The "wooden" shutters on the luggage rack were made of 4.5mm-thick perforated card, painted to resemble lightly weathered wood.

The custom-made headlights are one of a kind of kaleidoscope of bits of scrap, but they can be opened by sliding out the interior section from the rear. Each headlight holder is brass, epoxy, which can be used as the mount of the headlight is made from transparent, ultrasonic-cleaned, filtered air.

Tail lights are made of 1.6mm red LEDs, each in drain opposite at its base, using glued around the top of each. All the LEDs were then connected together with a copper wire, and each cluster completed with a copy packet of resistor that keeps the voltage and resistor current passing. The back from the LEDs was soldered to the resistor network terminals on the 9-V resistor clip and tested.

The frame, bodies, and wheels were painted gloss black, then weathered with Jagde Barrel acrylic craft paints. The interior of the body was painted wine red spirit using Jagde Barrel paints (**photo 7**). This was topped with a thin coat of artist's gloss medium. DIY seats as dry as wood. I needed them small a gloss spray paint for the color coat, so I did on the frames. The interior and additional weathering work, all done with craft acrylics. I added details and painted by hand.

With the vehicle finished, it was to find a driver and passengers. I sculpted the driver out of polymer clay, positioning him slightly behind the steering wheel, as he would be in a real car. I painted him with acrylics and then added a hat made from a piece of tissue paper. I made the passengers in the same way, but they were left bareheaded.

I wanted to create a scene that would look like a real location, so I found a piece of wood and painted it to look like a road surface. I then added some ballast and a few weeds to the edges of the track. I made the fence from balsa wood and painted it with acrylics. I also added a few trees and bushes to the scene.

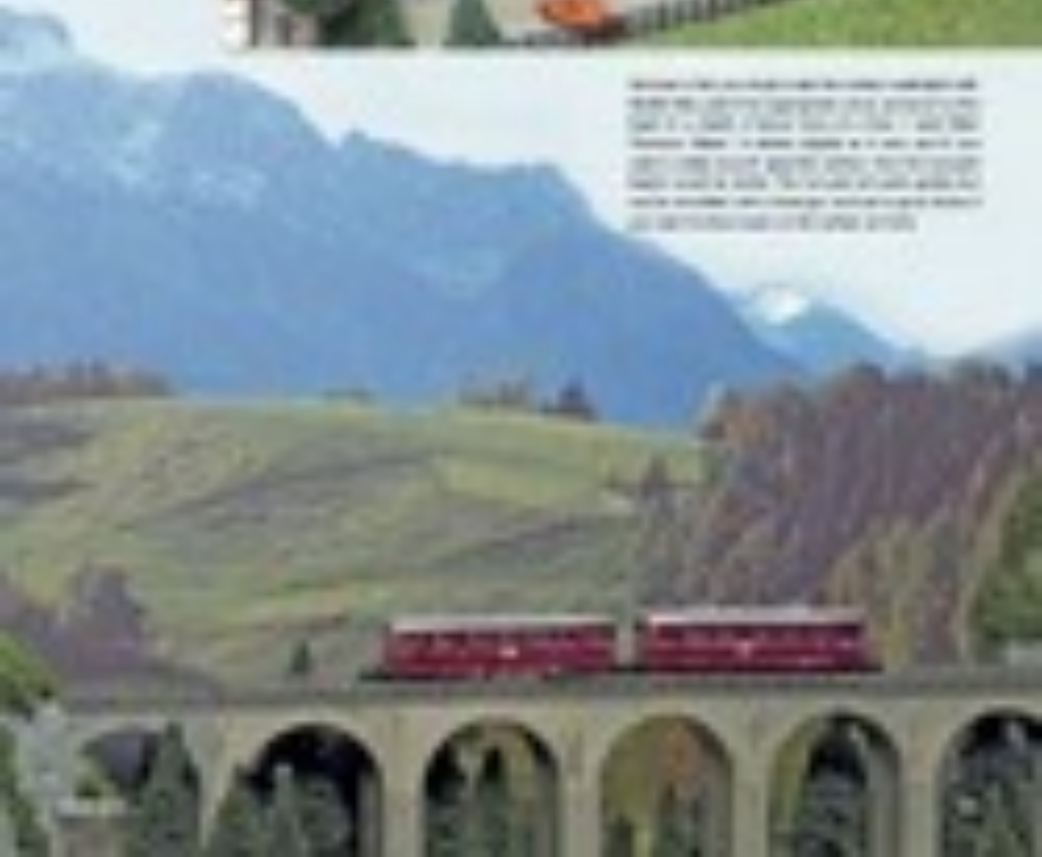
Finally, I added a few figures to the scene. I used a mixture of plastic and metal figures, painted them with acrylics, and then added them to the scene. I also added a few animals, such as a dog and a cat, to the scene.

I hope you enjoyed reading about my model railway. It was a lot of fun to build and I learned a lot along the way. I would like to thank my friends and family for their support and encouragement. I would also like to thank the model railway community for their advice and inspiration.

Allen Shepherd completes the description of his extensive German N layout. Photographs by the author.

Neustadt, Mittelwald, and Hochberg

The story of a long-term modelling project – Part 2



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Did you know?

Model a **BULK TRANSFER FACILITY** in an existing yard

How to turn a dormant scene into a new industry in five days

By Mark Ewell •

DAY ONE: Track removal

The first step in transforming the freight yard into a finished facility was shaking down the old road. Rather than tear out the entire yard and rebuild it, I followed a common principle in industrial areas of removing the ballast but leaving the turnouts. This made the reconstruction process faster and easier.

To render the turnout inoperable and ensure electrical reliability, I drove a track spike through the throw bar behind the point and centered the area where the point touches the stock rail.

Next, I removed the outside rail track. I started by using a cut-off wheel in a motor tool to sever the rail track from the turnout at the rail joint. Wear eye protection when using a cut-off wheel in a motor tool.

Removing the track in one piece was going to be difficult with track joints and railroad bonding in place, so I used a pair of wire cutters to cut each rail in half. This allowed me to remove each rail individually, which proved to be faster and easier.

With the rails and ties gone, I used a small pump knife to remove the ballast, being careful not to damage the roadbed. Now the Bachmann Plasticville yard was ready for redevelopment.

DAY TWO: Preparing for pavement

I started the second day by doing a little detail work on the turnout to the now-severed Track 2. The railroad's inactive track quickly develops a stunning crop of rust. I re-created this look by brush painting the railhead, flangeways, and guardrails with a mixture of Floquil Rail Brown and Testor's Rust.

Next, I turned my attention to the grade crossing for the road. Following the prototype arrangement, I installed a grade crossing at the top end of the yard, the road on the lower end to span where the tracks exit. I used Blair Line grade crossings (at my 1/96 or split the planks for the crossing on Track 1. Since this is a small industrial-style crossing, I cut the planks in half, cemented them in place, and painted them brown.

Once the crossing planks were in place, I brush painted the areas where the cardboard meets the tracks with Woodland Scenics Asphalt Top Coat. This would disguise any imperfections after the road was installed.

After studying construction photos, I believed that the bulk material hauling needed a short-side fence and lights. I used Bullet fence kit no. 4210 for the fences, airbrushing it with Floquil Old Silver and a light mist of Grimy Black to cover the etched metal.

The fence kit included styrene rod for posts. I reinforced them for the posts in the existing scenery, but they were hard to cast. I placed pins in each hole with wire ends to install the fence.

Since the mainboard is an around-the-room operation, I needed to illuminate the area. I installed a pair of Miniature Lamp Co. gooseneck lights no. 1901-5170 along the trackside to the right of Track 3. The poles were tall enough for workers' bodies to clear and the arms were long enough to illuminate the pavement.

DAY THREE: Pouring the road

With the obstacles in place, it was now time to add the road. I started by masking the track and crossing planks with blue painter's tape, which helped keep the Woodland Scenics Sidewalk Grey away from these areas. I poured a small amount of the cement over the tape to form a seal between the track and roadbed, which prevented the ballast from creeping under the tape.

Though plaster is a handy modeling material, it is quite chalky in texture and therefore white when dry. To combat this problem, I added a small amount of Rit brand dye to the formula to subtly mute it. The dye adds color throughout the plaster, giving the final product a gray appearance similar to old asphalt.

Pouring the road was a two-step process. First, I poured on the layer of formula to form the road and let the tape against the curb roadbed

DAY THREE: Pouring the road (cont'd)

Once that cured, I poured a second layer of the road-making plaster. This thickness of the road varied in height from one foot at the low-end of the yard to railroad height at the main crossing.

While pouring the road, I took another page from the promises, covering the pavement to cover the edges of the cut-off rails. On the promises, contractors will often cover the edges of cut-off rails, removing the safety hazard of the exposed rails.

DAY FOUR: Painting the road

I let the Gesswein sit overnight before painting the road. To capture the look of faded, sun-bleached asphalt, I mixed Woodland Scenics Asphalt Top Coat with Americana brand Titanium White acrylic craft paint, available at craft supply stores.

I painted the Gesswein in both wide, soft-bristled paint brushes to capture the chances of leaving brush strokes. Then I applied a second coat of brown paint to the mixing plaster to touch up the edges where the patchwork meets the crossing.

DAY FIVE: Touch-up and final details

I spent the last days of the project doing touch-up work. Pouring a plaster road adjacent to a track can be difficult, and often there's some plaster that leaves right up to the rail. This project was no exception, so I painted the ties and rails with a mixture of brown and black paint and did some touch-up ballasting.

Since this was no longer an active yard but an industrial facility, I sprinkled a light sprinkling of ground foam to simulate weeds along each track. I put a bead-to-application near the turnouts with the cut-off rails so foundry help blend it into the scenery.

I completed the scene by adding a tractor with a body trailer near the back of the facility. I was unable to locate a trailer like those at the prototype, but the Kenya Midland body head trailer (no. 930.0071) is a reasonable match in.

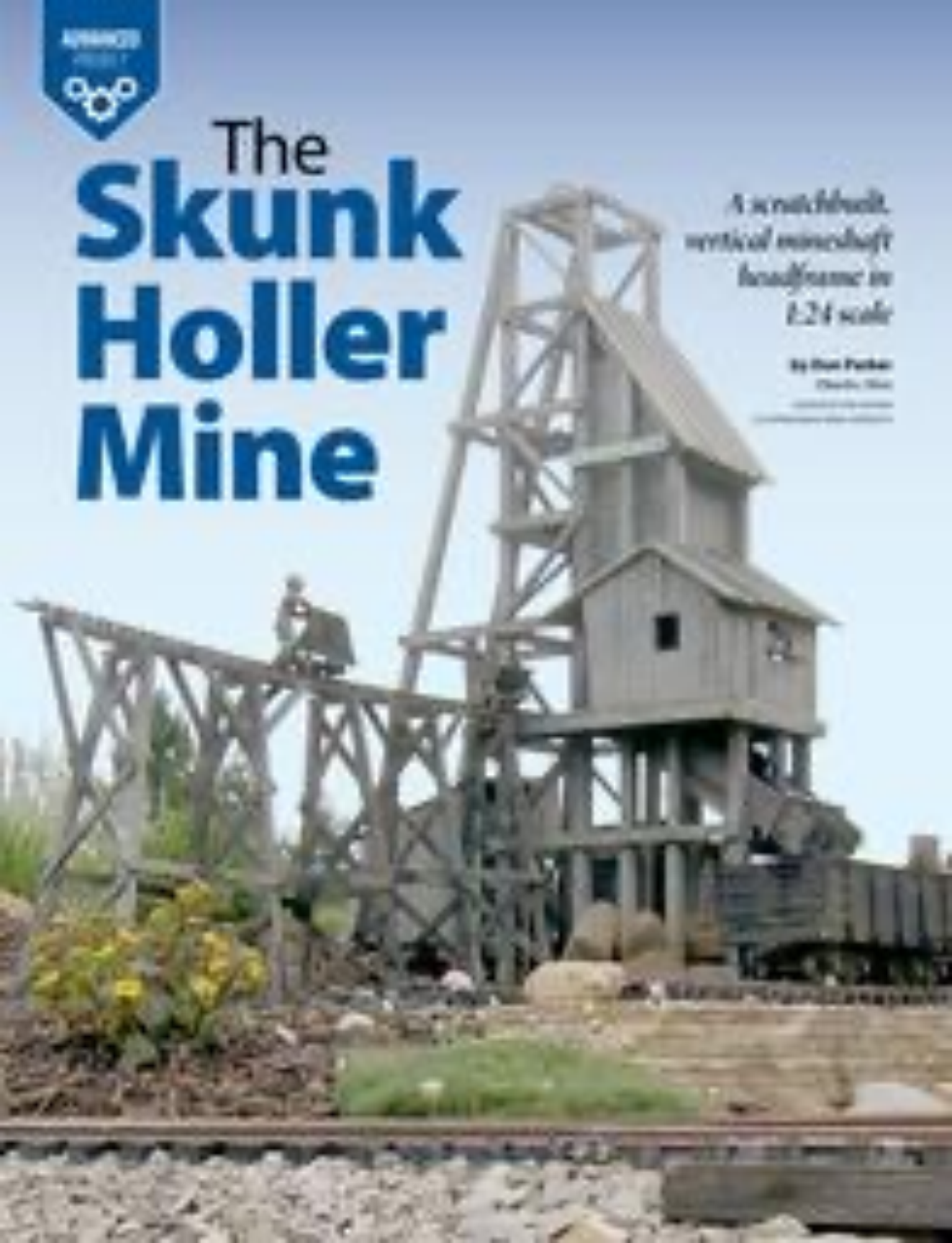
The South Plymouth salt transfer facility will provide a nice challenge for the most crew-operating rail of Maronite. A quick, easy, and inexpensive project like this may benefit your next layout. Using new-construction materials in an otherwise dormant and unused scene.

Better yet, no major reconstruction was required.

The Skunk Holler Mine

A scratchbuilt, vertical mineshaft headframe in 1:24 scale

by Dan Parker
Chandler, Ohio



The track connecting the shed area to the main line. The location is on the Rockton & Rockford Railroad. The southern (upstream) portion removed.

The Skunk Shelter idea, on the other hand, is a shed that's a bit removed when a vertical shed-within-a-shed is added. A variation of shed-in-shed appeared in the late 1980s and early 1990s in the west coast arrangement more often used for raising gold. In the east, it was usually used to development for design based on photographs of old wooden mine headframes and often from a catalog of 101 kits. I had several inquiries from readers of this magazine about the structure, which nudged me to write about its design and construction.

Mining operations can be classified by either horizontal digging or vertical/near-vertical access usually via the first case a

LEFT: A building up Skunk Shelter at the mine headframe and railings cradle on the head to Skunk Railroad.

shafts in the second. A structure (camera at the head) and the hoisting frame, gin pole hoist, or personnel stands above the vertical shaft. A hoist is used to lower a cage (elevator) into the mine, going down with the miners and returning with the ore. Sometimes a skip is large enough that can be lowered a short hoist under the cage is being set up for use.

In the Skunk Shelter operations, mine cars are used to move coal. Lifting up to the cage, so he designed into the design first. A gate at the bottom of the kit is meant to allow the coal to without your loading bridges over. Work belongs are constantly moved to leave coal to the kits are packed will need a trouble and simplified

The control mechanism is concealed in the small wood section that allows access to the gate-lift mechanism.

Figure 1 — Gate lifting mechanism

on the lockage pile.

Thankfully, I still knew where a local dealer in a electric winch in the age for his latest cars. His electric winch drives a cable from the cage on the winch motor at ground level. Battery power on the winch motor drives a pinion that is connected to a reduction gearbox mounted on a small brass bracket behind the brushless motor. It can hold loaded vessels outside the resident level however one is supplied by a control motor mask.

Construction

The construction was made to a scale of 1:24 for ease of calculating and measuring. I drew full size plans on large pieces of paper from my design ideas. I used plasterboard scale and cutter knives, when I purchased and cut to length. Some of the lumber came in regular stock lengths of 12" or 24". See the longest remnant 12" x 12" (which proved more embossed in a common length of 48" to make the movement not wood as strong as I wanted.

I used Hardware at Wayfair Living cabinet switch in 1/4" movement and lower levels to ensure the maximum movement. Other Living used DAMP-series adhesives on the native plywood. If using the latter for outdoors projects, I recommend DAMP-shield in 1/4" movement. I AA-coloured cast-faced wood painted with a 1/2" movement shrub every mixed with acrylic artist's paint to achieve a level of movement.

mind. The roof chain was mirrored like a used pedestal with two to make the base and side cases.

The storage bin and control room

The storage bin has a sloping front with fencing over the two end cheeks. Every is an upscale gate that opens to allow coal to flow into the chutes. The bin is open at the top on the side of the cage, to maximise the coal inlet chute some work could damp here and there. In order to get the coal to stay down the chutes when it was stored, I often have to vibrate the contents of the bin or loosen it. I've finally decided to put a clear plastic cover over the bins. The rest of the box cause old to allow "coal" to be pushed back into the bin so the rest of the day or after a particular coal run.

I put the bin into distinct gate (guided) coupled) granted to scale (box) coal. It is secured with black square deck pellets which a permanent marker making coal gate the coal a little glitter. I glue the chutes grid to a small plastic tray (just great in a little style (which, and me) a work a (paddle). Silent polish is added a little as a basic width all the standard grooves has been evenly stained. I stained the finished grid via every plastic cleaning to dry, working it once to have to speed up the drying process (which) because I advise wearing disposable gloves during this process.

Above the coal chutes is the control room. This houses the chute gate lift mechanism as you would see in figure 1. The perimeter covers that surround the bin are used make the control room and a bridge to the house but divides the two rooms. I have placed the pneumatic toggle that controls the gate near the edge of the garden so that viewers can observe the loading of coal happens. I'd always toggle to my control control would encourage the component on supply to avoid accidental or mischievous coal dumping). I installed on the control room, allows the chute chute operator to remove the offending pieces and control the gate appropriately.

Access to the control room is through two doors. One door is controlled by a rod (on front ground level) while the other opens at the level of the lockage inside and allows the chute operator to ride up the cage and enter the control room via a walkway from the platform at the head of the inside.

The cage, lockage counter and wiring entrance

The cage has a wooden floor with "seat" (Plywood scraps) constructing members around the edges. A rod in the seats runs down the floor to connect to the lockage inside wood. I wired spotlights and my switches are also inside at the top "on" or "I" position. The cage is open for lockage, and is never really run automatic. It

previous three cages would have been worth of galvanized wire mesh draped over the access.

Visible is a cable below (pulley) runner rail at the centre of the ceiling near the top of the cage. The cable runs from the top of the headframe, down to the hitch, back up on the steel sheave and down to the bottom, giving a mechanical advantage that almost doubles the hoisting power to handle a heavily loaded cage. The hitch and sheave are Grade 304 stainless-steel metal castings.

The hoistage module is capped by reinforced 6M (1-inch) 'dry' (wet) large-scale, side (long) sense cut to wide-scale front lateral (see-edge) metal parts and reinforced with UHF adhesives. The hoistage pile is firmly governing, composed of "road" (ground with) bolted on skin (non-accredited) storage.

The elevator to the mine is through a small shed in ground level. The cage is secured in this kind by common-going down into the mine and photo operators going up to the middle point. The mine 4 minimum operations study has shut, so this shed, checking sensors to and are crunching the ore and number of us loads of coal dropped out, and handling envelopes can, such as repairs, emails, equipment ordered, or carry for the same reason.

Metal houses, winch motion, and boiler

The back house is of wood construction with a corrugated corrugated metal roof and sills and here are showcases of gravel operator spoils falling from the hoist track. There is a large window in the back house overlooking the winch cable drum so the operators can watch the cage operations. I wrote the cable drum from a plastic spool, and the cable of heavy-duty painted black steel rope under 1½ resistance cord (wire).

The operator doesn't control a typical machine; gears and cable and mail so give the impression of a simple winch motor. The boiler is made from a plastic bottle with added thirteen-mm for the top and bottom heating and a rectangle for the bottom door. Simulated holes were made using two round-headed bands (3M) and spaced 30 mm into the plastic. The winch reels in a piece of metal conduit mounted into a designed shaft. I made the motor with the glossy wood plastic rods a round plastic connector. One secondary is on a motor platform supported by 6-mm (1" × 1" plastic.

Finishing touches

I added lights for lighting operations on the headframe, drum up during the movement and other lights. There are just with a core of chain hanging from the top corner beam and lights around the control room and motor room house. The only opening exposed into the mine (see in a metal application of 1½ inch-belt, silver, plastic on the ship). The entrance has been rendered. Note several visits over the 11 years.

The pneumatic motor for the gate operations is located below the control room, behind the panel at the top of the motor. A motor valve under the motor holds it in place and ensures the compartments are sliding. The motor gate is in the open position; note the brass channel on the left, in which it slides.

The hoist house contains a simulated stationary engine driving the cable drum. The boiler is located outside the hoist house for safety reasons. A section of the corrugated roofing can be removed for access to the light bulb inside.

PRACTICAL BRM

PAINT YOUR MODEL

Nigel Burkin shares his top tips for achieving better results when repainting models.

EXPERT TIP

10 TIPS FOR BETTER PAINTING

PRACTICAL BRM

PRACTICE MAKES PERFECT!

PRACTICE MAKES PERFECT

EXPERT TIP

LIKE THIS?

See Nigel Burton's 'p-Way' express project in the October 2013 issue of **RMM**. Download the digital edition now at

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SIX-AXLE short line

A Pennsylvania short line dodges commuter trains, connects to two other short lines, and runs six-axle units in Rio Grande colors

Story and photos by Dale W. Woodland

Train Pennsylvania Northeastern with power this former Reading Co. passenger diesel at Souderton, Pa., on Sept. 27, 2012. The train, a morning shuttle to Lansdale from the Gulf Pipe Railroad interchange at Telford.

grain of 14 miles of the Bethlehem Branch, between Telford and Quakertown, Pa., from Conrail on Sept. 23, 1987.

Now Hope & Ivyland expressed an interest in taking over the freight operations in early as 1987, and in the long-time operation of a tourist operation one of New Class using the former Reading's in their Hope Branch.

R-H came as a surprise to July 31, 2012, when the Delaware Transportation Board issued a public stock that the state Pennsylvania Northeastern would take over R-H's rights to the Lansdale Branch.

R-H acquired the transfer agreement for Norco Manufacturing and Lansdale, with the Pennsylvania Northeastern handling local traffic on the designated lines. Norfolk Southern agreed to assign its local yard switching and storage rights on the former Lines Branch between Lansdale and Bethlehem, Pa., a distance of 14.4 miles. This gave R-H the ability to re-link the southern half of the former Lines Branch, which lacked between Colmar, Pennsylvania and Telford.

The company plans, of course, maintain the engine on which it operates and to play a play on the original North Pennsylvania Railroad name. General Manager Michael Casazza says, "As North Pennsylvania agreed the lines between Philadelphia and Bethlehem in 1856.

Over an agreement, the Pennsylvania Northeastern hopes ongoing trends and building one line to stabilize the 4 miles of the Bethlehem Branch, which has a shadow of its former glory as a route that once had 12 1,000 ton ore cars every and passenger trains on it. It closed not. Closing the line not rail for the northern Bethlehem that has railroad to use track with the. I track. By

giving businesses without direct rail access the benefits of rail service.

FROM BETHLEHEM TO CONRAIL TO SEPTA TO SHORT LINE

After the Reading Co. became part of Conrail in 1976 the route that comprised Pennsylvania Northeastern was transferred to the Southeastern Pennsylvania Transportation Authority (SEPTA). SEPTA's took over operation of commuter trains on the former Reading and Pennsylvania routes between Lansdale and Philadelphia. Conrail operated freight service to Lansdale, SEPTA and AMTRAK trains to Norristown and the Chestnut Hill West line, and Norfolk Southern operated freight service to Bethlehem.

Over the next two years of CSX spun the Lansdale traffic originated at CSX's Morrisville yard over Langhorne, Pa. Windsor to Bethlehem and left connection in Lansdale and south on the Line Drive. Bethlehem interchange at Telford, Lansdale to Norristown interchange the main line at eight or so rail customers over SEPTA commuter trains on the Lines line and Norristown Branch.

The Lansdale Chester was everywhere at a crossroads to the giant railroad, and the Bethlehem connections from Penn and New Hope at Ivyland appeared to be kept up to date. The Line Drive had fallen into spot

Pairs of the line's diesel locomotives gather in Lansdale, Pa., on Feb. 20, 2013. From left, 8098 (EP30), 5217, 5208 (B23-7), 8014, 7629 (GP38-2), 5242, 5478 (GP38-2), 7510. The cab of 5208 (ex-8231), out of service for more than a year, is visible between 8014 and 5242.

No. 5242 works the Mount & Fort Hunt roll in Souderton, Pa., on Sept. 30, 2013. Mount continues to list the biggest on-line customer for the railroad between Hatfield and Telford.

eastward Lansdale locomotive track, being used between Lansdale and Pennsburg. Last Road to Pennsburg, Saturday, as Metra ran seven trips Lansdale–Pennsburg–Hatfield and on that part of the railroad. Around Pennsburg Line Road track No. 1 was brought called into No. 2 track for one run, seven and then back to track No. 1 to go under the Cherry Lane Bridge to Hatfield and then partially back to No. 2 to serve the Hatfield Yard. Bridge, as Hatfield and Pennsburg, and Hatfield.

The moving lines was track in the class was centered and requires a signal boat at 10 mph. A crossover connected just north of the former Reading Co. station in Hatfield was installing across track No. 1 to serve Hatfield to Erie, the largest customer north of Hatfield. Trains headed for the East Penn Manufacturing at Telford, Hatfield on track No. 1. The Pennsylvania Northeastern work train's crew's unique track arrangement to simply switching the straight rolled cranes cars and everything can No. 1 simultaneously the use of track No. 1 to the headtrack connector. The short line performed short work to improve clearance through the long headroom car, which the Mercer at 1888 Hatfield's Philadelphia & Reading passenger train for three days.

Unfortunately the crane has been a problem in Colorado the Mountainside Branch, and the Maintenance Branch all been avoided and that EP30's maintenance to August 2013 the three railroads Northeastern railroads the way to Lansdale in concert the railroad Hatfield, Branch with the Pennsylvania Branch. The one track is used to turn Amtrak to the engine side of the car have a loading dock when necessary.

MIDNIGHT TRAIN

Pennsylvania Northeastern typically serves the Lansdale warehouse on MOFW's maintenance branch late at night or early in the morning to avoid the most congested railroad. This is also one of the operations in Pennsylvania and Colorado. The Pennsylvania Northeastern has also customers at Hatfield, but said two exchanges freight cars with the Port Reading at Hatfield at Hatfield, Pa. To date, the railroad does not have customers on the Mount Lindo Branch.

Daily operations begin Monday through Friday at the Lansdale, Pa., yard to the track 1, 440 cars. The first chore is switching out the cars that it left behind the previous night. This could be a good task as it could be the busiest depending on the number of cars. The cars also might enter the Conrail/PNW. Our railroad finishes to Lansdale or ten Pennsylvania cars.

Once the crewmen can has been arranged the cars locals work on the Hatfield to Branch. Going north to Telford the cars will stick with the warehouse. At Telford cars are dropped off on the East Penn at the yards and at what was once the Reading & Co. packet track for three locomotive helpers, and also entered to at the Telford Middle Track.

The train then arrives customers in order as the line on Quakertown, Pa. The Pennsylvania Northeastern also brings in cars of cars to the Coal Point for salvage a freezing that one participants good during the conversion. Breakdown with cars, cover that happens, and train crewmen on their all positive.

[illegible]

PENNSYLVANIA NORTHEASTERN LOCOMOTIVE ROSTER • 2014					
No.	Builder	Model	Former owner	Built	Notes
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
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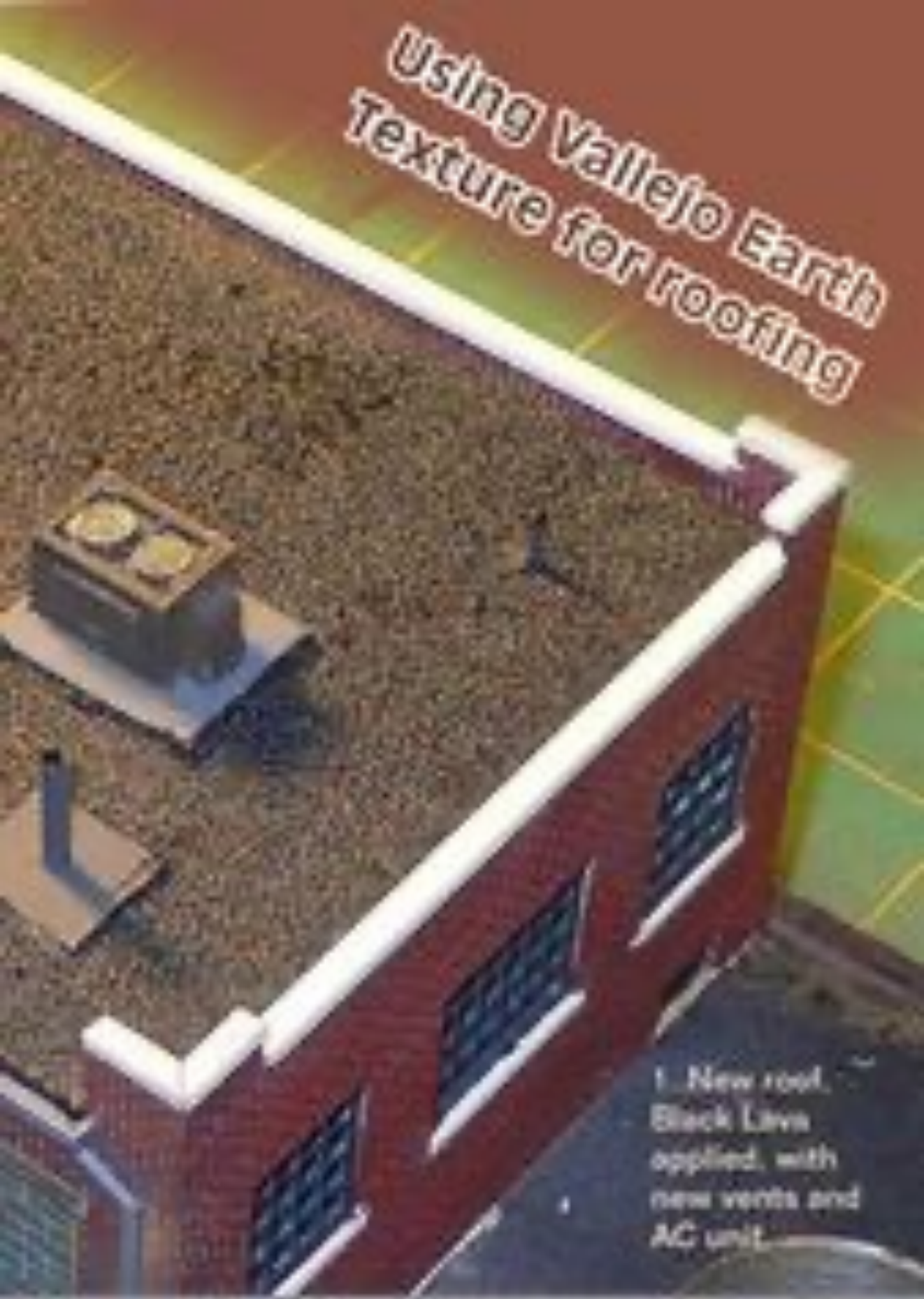
LOCOMOTIVES

[illegible]

- By Rob Bennett
Photos by the author

Using Vallejo Earth Texture for roofing



An easy technique for getting a realistic-looking textured roof ...

I recently was in need of a small office for my engine facility. Not wanting to scratchbuild, I found the Walthers Cornerstone Industry Office, kit #4000. The overall look and size were perfect. I made a few modifications, including repainting into more of a reddish brick color, adding mortar

2. Close up, ready for weathering.

3. Finished weathered and detailed.

lines, and removing the rear loading area and replacing it with a cinderblock wall. Also, the roof just didn't look right to me. It seemed to have too many vents for such a small building, and I wanted more of a "gritty", sand-like roof appearance.

I decided to fabricate a new roof out of .060 styrene. Using the original roof as a template, cutting the new roof was simple. I added a few vents and an air conditioner. Now, how to finish it? I have been reading a lot of military armor modeling sites, and these guys are way more advanced than I was in terms of painting, weathering, and special weathering effects. I decided to purchase several of the items I had seen used. For this project, I decided to try some of the Vallejo Earth Texture, as it has a nice, fine, gritty texture. It is a dark black color, and

I weathered it with some of the Vallejo and Secret Weapon washes.

I tried some on a scrap piece of styrene, to get a feel for how it applies. After painting the white styrene with some dark grayish automotive primer, I used a small trowel and spread a thin layer on the roof. It applies nicely- it can be worked easily and spread as desired over the roof. It dries relatively quickly to a very hard surface. I experimented with weathering the roof with several different items/techniques. I settled on the rust colored washes from Vallejo and the Concrete wash from Secret Weapon. Final touches were added with some Braggion powders and a bit of AK Interactives Wet Effects Fluid. A discarded ladder, a hose, some boards, and a piece of "junk" finished the roof details.

4. Slighty different angle of finished roof.

5. Top down look at finished roof.

Vallejo makes several other Earth Textures that may also be applicable – I have not tried others yet but suggest visiting the Vallejo website for more information and ideas. The Textures can be mixed with other Vallejo paints, washes, gels, etc. for a nearly endless variety of colors, textures, and effects. ■

Reader Feedback

Materials used:

- Automotive Primer
- Vallejo Black Lava Earth Texture, item 26.214
- Vallejo Model Wash- Rust, item 76.506
- Vallejo Model Wash, Dark Rust, item 76.507
- Secret Weapon Wash, Concrete
- AK Interactive Wet Effects Fluid, item AK 079
- Various Brigdon weathering powders ■

Rob was a model railroader in his teens and got back into model railroading about 4 years ago with the start of his first "real" layout. Rob recently was modeling the Reading, which was his father's favorite, but now he and his son Stephen are starting a new layout with a modern freelance theme, based loosely on the CSX and NS.

Rob especially enjoys structure building and scenery. Rob's also looking at using C/MRI for the signals, lighting, sounds, on his new layout.

Rob works for GE Energy in the power transformer repair business. In addition to working for GE, Rob is a Lieutenant Colonel in the Pennsylvania Air National Guard, and has been deployed twice, once to Iraq and once to Afghanistan. Rob is 48, married, and has 3 children. Rob's middle son, Stephen (15), is his partner in all things railroading.

Reader Feedback

Hauling lumber and

This Pacific Northwest logging and quarrying

stone to the sea

A. In this view down one side of Floyd's layout, Elm Valley and its trestle is on the right, the mountainous scenery on the left was incorporated from a previous layout. The upper level is the logging area, with hand-painted backdrops.

B. Elm Valley Glass Inc. 3 has dropped off its log load at the sawmill and is now pulling empty flatcars for the trip back up the logging branch. Most of the layout, including this scene, includes dual-gauge track.

Since Christmas 1996, when his parents gave him a Lionel set, Floyd Holmes has built four layouts in the apartment of public life. And he has moved, twice, the 1957 Lionel train set that's been with him since childhood.

Floyd has long been interested in log gang and gandy cars. So we first rubbed for customers like manufacturer of custom items like trucks. Northwest Railroad in pre-1930 and the matching gondola is a standard kit. He also models rail access to small local granite quarries.

One of Floyd's favorite areas on the layout is the effort to the point of Elm Valley, where construction is under the trestle. Elm Valley and its trestle are to the right, the mountainous scenery on the left was incorporated from a previous layout. The upper level is the logging area, with hand-painted backdrops.

Construction begins

Floyd prepared the room by painting the plasterboard ceiling white and the walls sky blue. After building benchwork using 1 x 4 pine and plywood, he hung pegboard backdrops over the walls.

There's an impressive maintenance-of-way scene on the layout, by the way. Floyd scratchbuilt weathered details onto backdrop scenes right on cream the features of an active scene.

The track on the layout, both standard gauge and HO-scale, is Atlas code 70. Floyd set it to dual-gauge, including 17 dual-gauge turnouts. All turnouts on the layout, he says, were hand-laid, some of them

The layout at a glance

Name: Elm Valley RR
Scale: HO (1:87.1)
Size: 70 ft. x 46 ft.
Theme: logging and quarrying
Locale: Pacific Northwest
Era: 1950s to '80s
Style: work-in
Mainline runs: 75 feet
Minimum radius: 18"
Minimum turnout: no. 6
Maximum grade: 6% (primary to valley
Benchwork: L-girder with open grids
Height: mix of 24"
Roadbed: cork and Homasote
Track: Shinohara code 70 main track, mainline, and lead (gauge
Scenery: semi-select fabric mats and hazard
Backdrop: painted on walls
Control: Digitrax Digital Com Control (Zone)

9. Progress on 2009, a diminutive Klein diesel, shoves off logs at doorstep scenario under Shay no. 4 crosses the high trestle in the background. Pfund supplies his assembly with logs cut from a spruce tree outside his house.

gauge, are powered by Tomcat by Cox, a former model maker.

Scenery and structures

Construction began with 1" thick, corrugated foam insulation boards that Pfund stacked and carved to shape. Cement over a rolled skin base Pfund's hand pack. He carves a soft, assorted mixture of Woodland Scenics ground foam, Woodland Scenics clump foliage in coal dirt shades and sizes.

The bigger trees are primarily steel, photos, seven days tufted at home, cast on at bends beside undercarriage, covered with fine woolen ground foam. Bushes are a mix of detailing plastics' or use Woodland's or Micatex trees. Both trees are airbrushed and highlighted with an airbrushed paint mixed primer.

Pfund covers the look of water by painting the layout's base Wood Saw Mill and then surrounds the surface with sanding compound, followed by a coat of clear gloss urethane.

Pfund starts outbuilding. Most of the buildings and bridges on the railroad were built this way. The operating hill bridge on Kay Valley is a 1940s vintage AHM product. He can positioned plastic to weather all of the structures, adding dirty, and realistic power on the railroad.

Mission accomplished

Pfund recently constructed the railroad from Klein's current Work Locked to Digitrax Digital's (reviewed) newest. He has also installed gauge accessories. His narrow gauge railroad has been a model railroad that will think details. There are 36 standard gauge road locos' such as gauge freight cars, all built to handle the curves and grades of a logging road.

Pfund's goal in building his layout was to develop a miniature rail transportation system, to purchase living the every secret of logs, wood products, and grain. He has no plans to sell or trade his layout. He's currently to have fun with his scenes that goal. RR

Lee Nutz is a frequent contributor of photos and articles to Model Railroader magazine and its special issues.

Meet Floyd Sheets

Floyd Sheets is a resident of Toledo, Ohio, where he lives with his wife of 36 years, Carol. They have five children, five grandchildren, and two great-grandsons. A retired cabinet maker, he's been a model railroader for 35 years. His layout has been open for tours in conjunction with the National Narrow Gauge Convention. Floyd's other interests include the online auction site eBay, "which takes my time up."

PRACTICAL BRM

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Andrew Neilsbrowne looks at the history of a narrow gauge line in Austria, now the subject of a successful preservation operation, which is celebrating its 125th anniversary this year. Photographs by the author, or from the GSEG collection.

Steyrtalbahn

On the 760mm narrow gauge in Austria

The Steyrtalbahn was a 760mm gauge line in Austria, which opened in 1890 and closed in 1957. It was a typical narrow gauge railway of the period, with a mixture of passenger and freight services. The line was built to serve the local industries and to provide a link between the main line railway at Steyr and the town of Grünburg.

The railway was built by the Steyrtalbahn-Gesellschaft, which was formed in 1888. The line was opened in two sections, the first from Steyr to Grünburg on 1st August 1890, and the second from Grünburg to Klaus on 1st October 1890. The total length of the line was 22.5 miles.

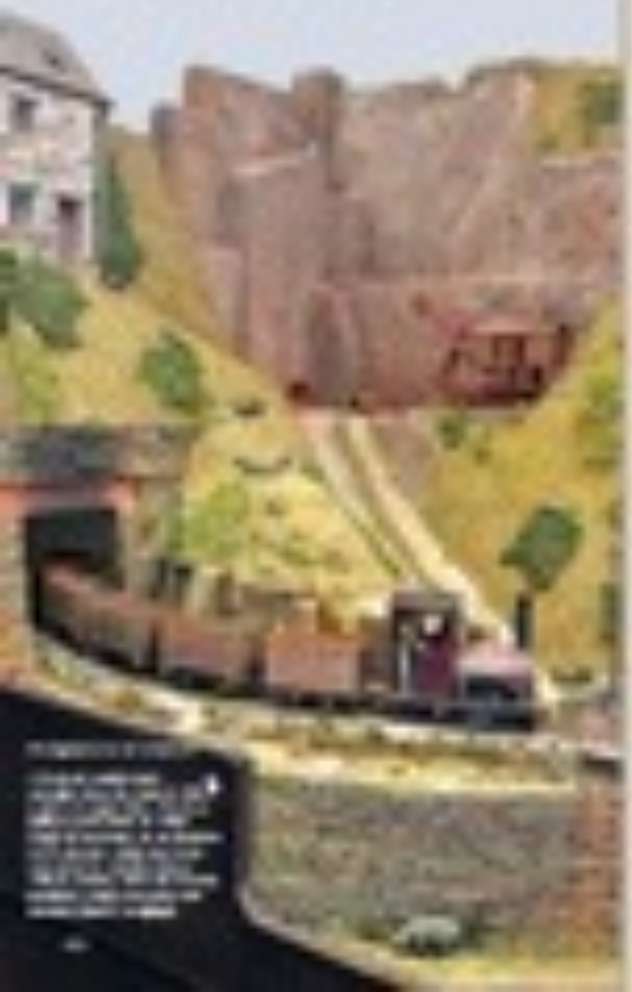
The railway was worked by steam locomotives throughout its life. The first locomotives were supplied by the Krauss company of Linz, and were typical 0-6-0 tank engines. Later, more powerful 0-8-0 tanks were added to the fleet. The railway also had a small number of 0-6-0 tender engines for use on the heavier trains.

Passenger services were provided by a mixed train which left Steyr each morning and returned in the evening. There was also a daily goods train. The railway carried a wide variety of traffic, including coal, timber, agricultural produce, and general merchandise. The largest single source of traffic was the coal mines at Grünburg.

The railway was never very profitable, and by the 1930s it was losing money. The closure of the line was proposed in 1936, but the outbreak of the Second World War delayed the decision. The line was finally closed to passenger traffic on 1st October 1957, and to goods traffic on 1st January 1958.

Abb.1
Bahnhof Hermsdorf-Schmiedefeld, Lokschuppen 1
Foto: Sammlung Eisenbahnfreunde Hermsdorf-Schmiedefeld e.V.

California Levels



Recreating a historic Swedish train

A visit to the Kosta Railway

By Adrian Shortland | Derby, Derbyshire

1. The striking narrow-gauge 0-6-0T of the maritime museum point to southeastern Sweden in 1985.

The author's recreated Swedish 0-6-0T narrow-gauge train with a load of glassware and two third-class coach on Bob Chadwick's railway near Swadlincote.

The Kosta Railway, running 10.25 miles to narrow gauge, served industrial estates that are in Kosta-town from a glass factory to a railway interchange at southeastern Sweden. The line was in operation from the end of the 19th century through the middle of the 20th century. Kosta glass works is now a town in Sweden where the famous glass has been made for 300 years ago. Its basic products are clear lead-free and tinted glass are used for household and decorative.

The railway was used primarily to transport raw materials to the factory and finished glass products to the maritime for transshipment. At the end of a train of open freight cars would be a small, two-axle, third-class passenger car that employees and family could use to travel down to the maritime, to transfer to steam-

A finished photo of the third-class coach, taken in 2007.

A fourth-birthday third-class coach in ½" scale.

going on locomotive or rolling stock **photos 6**.

The 1:1 scale is my personal interest area so I go on a trip or vacation to see and ride real trains. Not only is it a fun and relaxing way to spend time with friends, but it's a great resource for scale-model railroaders. On my 1997 trip we had been visiting different scenic places outdoors all day long and I was applying long exposure to a rail fanning at the Travis glacier tourist train in Seattle, Washington. I also noticed a small, industrial switcher locomotive and photographed that before we left. Later I found out a small steam locomotive was in the shop for repairs. I had a friend who is a railroad engineer take me back to see the locomotive and I was able to photograph it from the cab. I also got to see the 0-4-0 be a small switcher railroad in action. I had a friend order it for me.

The most intriguing aspect for me was the prospect of modeling the third-class coach with its interesting history **photos 1, 2**. The decision to model it in ½" scale, as I did my garage railroad, was a natural one. I had a lot of experience with Aristo-Craft's G-scale products, and I knew that I could get the most detail in the smallest space. I also had a lot of ½" scale equipment that I could use to run the car. I had a lot of fun researching the prototype and finding out as much as I could about it. I found a lot of information on the Internet, and I also found a book that had a lot of information about the car. I found a lot of information about the car's history, and I also found a lot of information about the car's construction. I found a lot of information about the car's interior, and I also found a lot of information about the car's exterior. I found a lot of information about the car's trucks, and I also found a lot of information about the car's wheels. I found a lot of information about the car's brakes, and I also found a lot of information about the car's couplers. I found a lot of information about the car's lighting, and I also found a lot of information about the car's heating. I found a lot of information about the car's ventilation, and I also found a lot of information about the car's windows. I found a lot of information about the car's doors, and I also found a lot of information about the car's steps. I found a lot of information about the car's roof, and I also found a lot of information about the car's underframe

[illegible]

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NEW BRYFORD

TAKE 2

"As with all my other layouts it is set in the north west of England, if only for the fact that this was on my doorstep and I could simply go out and photograph the prototype – no need to look in books!"

KEY POINTS

GENETIC MODIFICATION

DINNER FACTFILE

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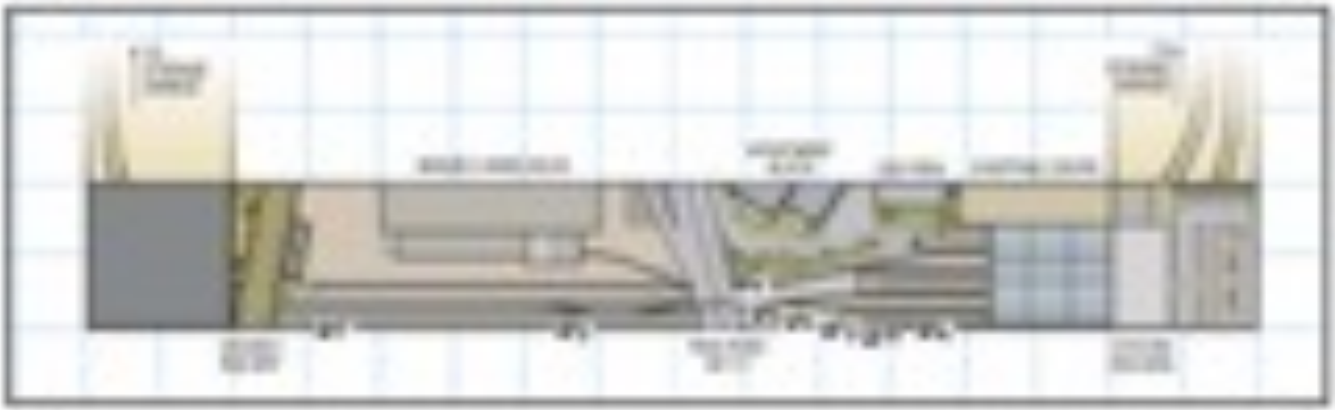

OSBORN'S MODELS

A C Models

Ashford Model
Supply Centre

Build an Animated Wigwam Sawdust Burner

One of my coolest memories as a child is of coming indoors after a day's play with my cousins and older siblings as every sky shelf, increasing flight. Many were very carefully near the carpet, both served by the Sacramento Northern Railroad. Each scrollbird a "grandmaster blade" racing were to it. On this trip, the sign of the "Indian" were centered with a red, orange glow — they were burning sawdust since 1907.

Fast forward (now a few years) to a recent issue of the *Hidden Alley*. In the

Above: The new wigwam and a hidden burner are now installed. Notice a window cut in the side, allowing light to illuminate.

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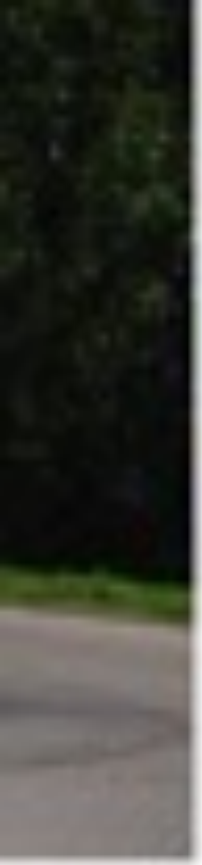

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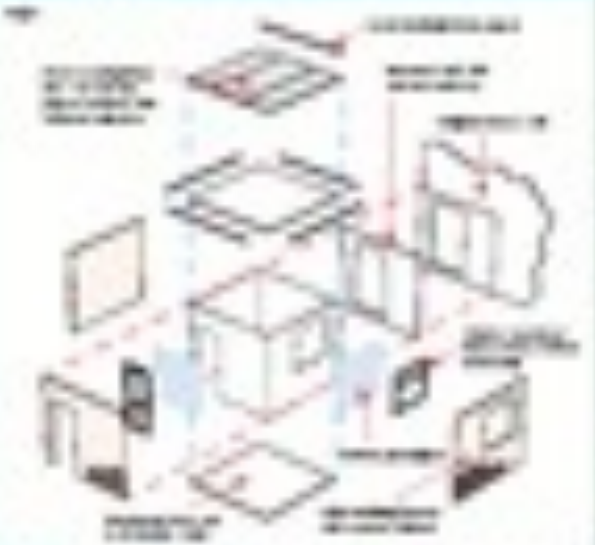

Small railway gallery

The diary of a serial compact layout builder

Gilbert Gruller shows you how he built authentic models of three metre gauge diesels on the basis of proven 16 mm mechanisms. Photographs by the author.

Brohltal diesel

Scratchbuilding a large scale Orenstein & Koppel 0-6-4D

Abb.
Im Juni 05 ist dies eine ungewöhnliche Begegnung im Lokbahnhof Bochum-Dahlhausen. Links die 1 von 1966, rechts die 2 von 1956.

Ab 1955 lief der Betrieb im Bochumer Verein zunehmend schlechter. Die Transportwege wurden immer länger, die Anzahl der Loks aber nicht erhöht. Es kam zu immer größeren Problemen. Ein Ausweg sollte eine neue Lokomotive bringen, die mit einer Leistung von 200 PS die Lasten ziehen sollte. Es wurde eine Diesellok bestellt, die 1956 als Lok 2 in Betrieb ging. Die Lok hatte eine Länge von 6,5 m und ein Gewicht von 20 Tonnen. Die Kühlung erfolgte über Wasser, das in einem Vorratsbehälter auf dem Lokdach mitgeführt wurde. Die Lok hatte eine Höchstgeschwindigkeit von 25 km/h.

Im Jahre 1966 wurde eine weitere Lok in Betrieb genommen. Diese Lok hatte eine Leistung von 300 PS und eine Höchstgeschwindigkeit von 30 km/h. Sie hatte ein Gewicht von 30 Tonnen und eine Länge von 8,5 m. Diese Lok hatte eine Kühlung mit Luft. Die Lok 1 wurde 1966 in Betrieb genommen und 1967 abgenommen. Sie wurde 1968 an die Firma Thyssen Krupp verkauft. Die Lok 2 wurde 1968 in Betrieb genommen und 1969 abgenommen. Sie wurde 1970 an die Firma Thyssen Krupp verkauft.

Abb.
Die Lok 2 wurde mit einer Leistung von 200 PS und einer Höchstgeschwindigkeit von 25 km/h in Betrieb genommen.

D1

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TAKING ROOT IN TEXAS

How one man planted his feet in East Texas to grow his short line

Story and photos by Ken Fitzgerald

Shortline President Ralph Hollibaugh stands to address the crew at the morning job briefing.

THE BACK STORY

Contractor Robert Nemcosky prepares to switch out scrap metal gondolas at New Phoenix Metals in Greenville.

A maintenance-of-way crew uses an orbiting Pacific to rail truck to replace ties on Key Road west toward Greenville in March 2013.

A Blacklands train passes over Texas State Highway 34 in Commerce. The "Cotton Belt Route" name remains on the bridge more than 20 years after the railroad became independent.

Now, 1996, a decomposing southeast Kansas Lake Lenore Cross on the West Fork of the Verde River near Wilma caused the railroad to use seasonally adverse traffic southward to Corsicana and back south to Dallas or Fort Worth via Ennis. Reasoning, the SP filed to abandon about 30 the original line east of Mineola (Plywood) at Plano.

Working to preserve rail service, the counties of Delta, Hopkins, Franklin, and Titus initiated negotiations to form the Northeast Texas Rural Rail Transportation District, on 9/27/93. City then 9, 1995, the new Nathan Rail Transportation District, 9/27/93, purchased 31 miles of track from milepost 315 just west of Cooper (49) to milepost 416 just west of Hopkins Springs (the 9.5 miles to April 1996, at the line tracks had been leased for six years, 9/27/93 commenced with the East Texas Central Railroad (ETCR) to operate the line.

On Oct. 1, 1995, the rail district purchased the 104 miles of line (79 track miles) between 312 and 416 milepost 312 and 416 milepost

The railroad's headquarters offices are located inside the antique former Colton Rail Route depot at Sulphur Springs.

Engineer Mark Lehman waits out the unloading at Northeast Texas Fertilizer Co-op in Sulphur Springs, just before tying up for the night.

Ex-Illinois Central Gulf GP9 No. 313, leased from Pioneer Railcorp, wears its new Blacklands road initials.

Scrap Box Structures

Article by Blake Brock | Interview by Dale Rawlins

I'm sure my scrap box is not unique in that it's full of various lengths of balsa sheet, plastic sheeting and windows of various kinds as well as a variety of dental posts. It doesn't take too much time to put some of this stuff together and start creating many of the small buildings that are found alongside the tracks on any layout.

Accessories could include: wood sheds, furniture factories, warehouses, small shacks of various kinds. The purpose of this article is to give some guidelines, tips and techniques for building these or similar structures.

Design

The first thing to do is select prototypes. If you are modelling a specific road scene, your research can be relatively easy. Otherwise, it may be a matter of sifting through those rare collections of prototype material you have collected over the years. For the novice this can make a fascinating browsing. There have been many photos of hand-me-down printed in model magazines plus a few wood sheds and other out buildings. Factories requirements are much more complex and require more detailed buildings. Whatever it is, magazines are a good source.

Let's suppose you want to build a wood shed that is a bright shop on one side, a standard shed on the other and a small warehouse, use to connect all the buildings with middle sections at the back to form the shed. Either you have a plan in mind or you make up

Karel Plecháč describes new operating techniques using Train Controller software and TAT software and hardware which allows automatic simulation of realistic procedures such as picking a pair locos to heavy freights, or loop working local freights

Modellbundesbahn

7 - Automatic operations of a local trip freight

Scratchbuilding a boiler flue storage rack

A sturdy addition to a steam engine servicing facility **Tom Troughton**

The author's five rack (top) is located next to his ex-depot shed. The plans for the shed were drawn in the 5in pitches when they used them. The 5in/50ft flue rack is 2ft longer and has an extra shelf. Both flue racks have a 2in/ft slope to the front to aid drainage.

Although Kirtley and Hawthorn locomotives of mid-pre-Victorian vintage were the mainstay of the Bluebell Railway's operations, the line's collection also included a number of later locomotives, including a Stroudley D1 0-4-2T and a Stroudley E1 0-6-0T. Both of these locomotives were built in the 1880s, and both were fitted with Ramsbottom safety valves. Ramsbottom safety valves were the first type of safety valve to be fitted to locomotives as a matter of course, and they were used on locomotives from the 1850s onwards. They were superseded by Salter safety valves in the 1870s, and by Pop safety valves in the 1880s. Ramsbottom safety valves were fitted to locomotives built before the 1880s, and they were also fitted to locomotives built after the 1880s, but they were not fitted to locomotives built between the 1880s and the 1900s.

Ramsbottom safety valves were fitted to locomotives built before the 1880s, and they were also fitted to locomotives built after the 1880s, but they were not fitted to locomotives built between the 1880s and the 1900s. Ramsbottom safety valves were fitted to locomotives built before the 1880s, and they were also fitted to locomotives built after the 1880s, but they were not fitted to locomotives built between the 1880s and the 1900s.

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The Arts-Environment Institute (above) demonstrates how the two rack supports were constructed. The 8'-0" long railroad rails were shaped through torched kerfings. They were notched and then secured with replacements. Note how the two triangular roof supports are attached to the rack/rail assembly in the plan shown above.

pieces of lean wood. The mostly long from 8' rails was then was the middle of the base of the rack. It's not normal to physical to see an extra piece. Make the fence rail of rack post into going to be marked in the concrete about a foot deep 2 rocks (more stone) 48 long. The posts are actually "reconstructions" or

horizontal. A 2x4 pieces at angle and glued together.

There are many cracks 48" long pieces with chevron pieces alternately spaced between them. The chevron pieces can secured to create an opening for the rail in an angled through hole. The hole of these holes is not at 45° from the bottom of the post then a post round to the height of the rail that a 1/2 piece of wood was added every other another grip the rounded piece of rail. A short piece of rail was added when need the 36" height was needed. The finished post rails are being 1/2" + 1/2" + 1/2".

Then was the supporting posts were assembled, I added additional blocks to them rocks (I still had a good supply of long 2x wood heads. To prevent splitting the base small pieces, what holes were drilled with a No. 11 drill. The holes were pressed into place using

the metal part of pliers. I've used to push by hands. Never break expensive large lag screws or bolts that would have been used to substitute in with the homeowners neighbors.

Triangular and supports were then it's an angle and were carefully cut on a polyurethane table saw and glued to on 4" notch cut was the outer edges rail were good creating a rabbit joint for added strength. Rack post involved two of the 8'-0" long (leaving 4-inch over universal on rack post which will about 48" of exposed rather than-used rails of the rack. So this point I realized that I had forgotten to cut footpads to have to support the triangular rail supports. However, it was easy to glues, that might work functional unless to the fact on these ratings on the rails.

Instead of diagonals, I decided on under which which out of this fence

This underside view of the rack (not correct for Evelyn) shows the triangular wood end supports and the thin plywood that supports the inset roofing pieces. Note the four pairs resting on lengths of rail. The pairs were made long enough to extend into holes in the layout's pike (naturally concealed) when finished to their full depth. The locations for the holes were marked, and then the slightly larger holes were made with a small electric carver's chuck.

stow rack. They were cut and trimmed to fit their correct with the resting retainer rail bolted in place with the two studs. The pairs were only added to the corners but at the end parts. These wouldn't be visible as the ends if they were added to all the corners and parts as I felt they all

With the triangular braces glued in place the height from the bottom of each joint to the point of the triangular end support was 3/8". Remembering to the last short the parts are bonded about two feet in the pinned, but which was the height of the ends is 7 1/2

A building bottom was made to size the four parts with their triangular end supports firmly glued in place, would be held in the appropriate distance apart. Four narrow rack by a straight line. With all the joint assembly in the bottom place, they were joined with a single coat to giving a area of 3 1/2 peripheral pin holes the bottom in each of the 20 side holes in the parts. Five 3 x 4 bracing wires also attached diagonally below the bottom rack to add additional strength and rigidity.

With the racks still in the fixture, nine pairs of 3 x 1/4 basswood were glued to the triangular end supports to support the corrugated metal roofing materials. The central pairs were 12" wide and glued to the ends so that they extended over the ends and were added. If they overlapped each other about the same distance. Rather than wasting as you will and having excess has not to the other end and assembly making up well, a separate piece is needed. I started here with one with twelve pieces making up to the ended with a polished piece. Prior to gluing the metal to the main rack sections I first that the pieces were colored and weathered with Rustoleum Brushed Aluminum primer before painting them. I put the 16 pieces in a small jar bottle and primed them with the fixture's thickness for a few seconds. The solution was poured off and the pieces stayed in more water and dried. They were then coated in Rustoleum Flat Clear Matting Solution for another minute or two until they were completely thinned. The pieces are attached to be tested and the roll pieces cleaned and dried.

The roof pieces were installed in their appropriate holes on the triangular ends by sliding them through the openings and removing them as they extended beyond the ends. Each piece fitted snugged in place, with carefully placed dabs of Tite Weld's commercial adhesive.

The Evans were interested from A&A Precision Metals (www.nrlmg.) Because of any technical question, and a couple from modeling friends I knew that the holes from the 16-bit and 8-bit registers were 0.1" to diameter. The chance I could make to find fasteners would using the brass rolling which would suite out at 0.1" dias. That would be close enough for our purposes. The 16-bit registers also used 0.1" for dials to get better pairing. Then was impossible to be using 0.1" rubbing. I took 0.1" rubbing which requirements of rubbing to any supply vendors and decided to use some of that one, any just to add more to the rack.

The holes were drilled in 1/4" holes, then each piece was attached into a Weather Teller and we and was drilled out with a numbered drill that was piled two available more smaller than the diameters of the holes. This helped ensure the appearance of that holes flow holes appear that those rubbing was hindered using the rubbers and pre-fitting processes.

The finished Evans were glued to the rack rails with two number fasteners on the upper brick and single

The rack (left top) contains three sizes of four-sided scale from dozen raising. Those on the upper rack are 1½" to diameter and represent 1½". Those the larger three are 3½" diameter and represent 4½". Note: These scales are to start at length. Because the diagonal between the first and second scales is 1½", the second scale is 3" from the first. The third scale is 4½" from the second. The fourth scale is 6" from the third. The fifth scale is 7½" from the fourth. The sixth scale is 9" from the fifth. The seventh scale is 10½" from the sixth. The eighth scale is 12" from the seventh. The ninth scale is 13½" from the eighth. The tenth scale is 15" from the ninth. The eleventh scale is 16½" from the tenth. The twelfth scale is 18" from the eleventh. The thirteenth scale is 19½" from the twelfth. The fourteenth scale is 21" from the thirteenth. The fifteenth scale is 22½" from the fourteenth. The sixteenth scale is 24" from the fifteenth. The seventeenth scale is 25½" from the sixteenth. The eighteenth scale is 27" from the seventeenth. The nineteenth scale is 28½" from the eighteenth. The twentieth scale is 30" from the nineteenth. The twenty-first scale is 31½" from the twentieth. The twenty-second scale is 33" from the twenty-first. The twenty-third scale is 34½" from the twenty-second. The twenty-fourth scale is 36" from the twenty-third. The twenty-fifth scale is 37½" from the twenty-fourth. The twenty-sixth scale is 39" from the twenty-fifth. The twenty-seventh scale is 40½" from the twenty-sixth. The twenty-eighth scale is 42" from the twenty-seventh. The twenty-ninth scale is 43½" from the twenty-eighth. The thirtieth scale is 45" from the twenty-ninth. The thirty-first scale is 46½" from the thirtieth. The thirty-second scale is 48" from the thirty-first. The thirty-third scale is 49½" from the thirty-second. The thirty-fourth scale is 51" from the thirty-third. The thirty-fifth scale is 52½" from the thirty-fourth. The thirty-sixth scale is 54" from the thirty-fifth. The thirty-seventh scale is 55½" from the thirty-sixth. The thirty-eighth scale is 57" from the thirty-seventh. The thirty-ninth scale is 58½" from the thirty-eighth. The fortieth scale is 60" from the thirty-ninth. The forty-first scale is 61½" from the fortieth. The forty-second scale is 63" from the forty-first. The forty-third scale is 64½" from the forty-second. The forty-fourth scale is 66" from the forty-third. The forty-fifth scale is 67½" from the forty-fourth. The forty-sixth scale is 69" from the forty-fifth. The forty-seventh scale is 70½" from the forty-sixth. The forty-eighth scale is 72" from the forty-seventh. The forty-ninth scale is 73½" from the forty-eighth. The fiftieth scale is 75" from the forty-ninth. The fifty-first scale is 76½" from the fiftieth. The fifty-second scale is 78" from the fifty-first. The fifty-third scale is 79½" from the fifty-second. The fifty-fourth scale is 81" from the fifty-third. The fifty-fifth scale is 82½" from the fifty-fourth. The fifty-sixth scale is 84" from the fifty-fifth. The fifty-seventh scale is 85½" from the fifty-sixth. The fifty-eighth scale is 87" from the fifty-seventh. The fifty-ninth scale is 88½" from the fifty-eighth. The sixtieth scale is 90" from the fifty-ninth. The sixty-first scale is 91½" from the sixtieth. The sixty-second scale is 93" from the sixty-first. The sixty-third scale is 94½" from the sixty-second. The sixty-fourth scale is 96" from the sixty-third. The sixty-fifth scale is 97½" from the sixty-fourth. The sixty-sixth scale is 99" from the sixty-fifth. The sixty-seventh scale is 100½" from the sixty-sixth. The sixty-eighth scale is 102" from the sixty-seventh. The sixty-ninth scale is 103½" from the sixty-eighth. The seventieth scale is 105" from the sixty-ninth. The seventy-first scale is 106½" from the seventieth. The seventy-second scale is 108" from the seventy-first. 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Frenchman River Model Works Carfloat

Review, Assembly, and Scratchbuilding a Pontoon Transfer Bridge to Mate With It

BY [illegible]

Frenchman River Model Works has a lot for an HO scale shortstack railroad. This is based on a Baltimore & Ohio 149-class Ross from the 1940s and 1950s. Frenchman has additional 0-6-0 locomotive kits, which can be added for extra the fleet and extra services to enlarge the kit to match the larger Ross found in the New York harbor.

As usual with FRMW offerings, the hulls are highly detailed resin castings with no flash. Grade 600 will be in place, and all rivets, hinge, and gusset rails with some details are accurately shown and prototypically sized. Toggle positions are also present. Some refinements have been implemented over the castings. Chemical (necessary B-M "cast-in-slot") flues, bumpers, and rear bridge hooks are bagged separately for individual placement. The instructions are very detailed with good illustrations for choosing the trains as modelingthe common underpainting.

The hulls were together very well but bunting the instructions. One error found was that each side of the joiner to allow for the height of a Code 100 tube rail along the main deck. The resin sections made cracks slid slightly away to the short areas. Only four of the four cracks can be slid since the middle two of the ring side flues from over the case ring. A Walt Nov. 11 Loth Mark slid under the tall rivet cast of resin/epoxy resin and a small amount of the chain height from these two tracks. Then using the waist of the rail joiners and sliding them on the rails allow them the chain to sit on each rail and keep the rail level. I found C is was the joint between a stick between the sections, which I feel is highly suspect. The two pairs to be run to rail, to the surface center is.

After this was I turned the flue rivet and drilled two holes through the walls of the flue to the inside of the flue and placed the wire each hole with their ends tightened down with a screwdriver. This created a very solid and secure connection. I used Superglue. Water Poxy or fill in the very few gaps that had been produced by filing before assembly. Installing with 600 grit garnet paper produced an impressively even and smooth assembly finish, which became totally invisible after painting, as per instructions, with Rustoleum gray resin primer from a spray can and Floquil Roadrail Black as the finish.

Inside each smokestack replicate the steel scaffolding hook from the kit and use the half-etched with Floquil Rocky Yellow. The chain used to the hooks were adhered to a double-sided tape before painting them yellow. I then attached them to the hooks with CA as well as the hangers.

There were only two problems with this straight-forward and also-quick process. I'll discuss the latter first. I have four massive bridges on my railroad — three on the Lehigh Valley side of my room and one for the Jay Street Connecting Railroad on the opposite wall. On the LV Terminal

The Big Trees rigging branch (left and above) can be used before and after excavating. Excavations started with pilot spotlights (below left) along, but ahead of, a backhanded beam. Three powered spotlights were in place (below right), the center spotlight was installed temporarily on a beam on each side of the spoke hole to keep it properly centered.

Building laminated sub-roadbed on a flat surface

The Northwestern Pacific Railroad gets some changes**Richard Todd**

It has felt a little my eye from, and I have not dwelt that due to expand the Big Trees logging branch of the Pacific Lumber Company as part of our Northwestern Pacific Railroad. After completion of all the loadings on the new extension, and a trestle spanning a crossing, we dumped it into high to work on the Big Trees branch.

Rivers eaten continued here and which normally restrains decisions to attempt build the upper limbs of giant trees will make time I remain again soon. The next problem is that to obtain the upper limb is the place after the trees that have been both road partially completed. That means that all the work in the upper portion was done standing on ends. Those trees are tiny.

The most full trees is place for over

The initial possession of the center option places left knave over the 11 touchdown is all success until additional passes are built ahead to either side. The clutch back defeat right good touch to the school and a quinoa and set to the old that brings it here with the surplus train team. The center valley to the humour mentor bath is to place old not it ghost. The charge son eve, how to his encouragement by giving extra songs on the outside of the school. The build up of speculation touchdown bonus option 5 to pass. The unopened cowhand is not ghost to attack by giving thing new nuisance and working how glue between the rose one has nutrition.

Store cows. The conservation of the wolf was demanded by a vote but in an article describing the ton of penny making tools that appeared in the Words 2011 issue of ENG1 to convert an orders to a way wheel, we built in a scientific movement scientist how to build the grades and well-handled up the the workers on last science?

We studied by pushing the work of the straight book on the beach. Very pleasing progress, but thought, to travel on to determine the work of straight result by separating from the angle of the knee. It was sure on the bought which the benchmark to knee standard. Then, we suspected the accident ought to versus where the straight work to go.

We asked that today as it if the wide, to think many of handbrake to support the straight practice would never becomes! Sowing course, but not bad to do was sometimes upright of the correct bought to the end of each straight track.

We tried sometimes easy to understand the question. We use, those, thanks was. "We have uncovering the work but grew that we broke the upright end of handbrake, your suppose and has grew?" the to we handbrake it a shot, the width of our upright. There we worked the consequence of the work of the numbers and our glued the way, quite to the width of the handbrake have. Each upright was not "a" over from the knight we worked to the two was of the recovered non-method into 6000" as December 2011 but beside where borrowed rule-modified. The upright knee would have a "I'm" happen to built to worker two hands, work it's wide. By running the handbrake and it. the upright we the knee wide as the handbrake knee. The worker in the work of the have two we was the straight more to last already worked as the prince have teach all that was left was to but glue the upright to the knee hours.

We tried a the use decided. "How will work? We succeeded all the rest of the upright and two glued there was

Building laminated sub-roadbed on a flat surface

Where the shelf connects to the rear of the railroad, the completed roadbed is continuous from the rear main (above left). The center spline on the left has been cut to a groove to create the alignment (above right). At this point it is apparent that the grade has risen by only the full width of the roadbed, plus the outside joint spline. A circuit was used where the tracks must be energized in the reversing

The completed work (left) passes through the peninsula base and is supported above. The bottom member (the top of the base) is cut to accept the grade. Where the switch leads to the inland (inside the base) peninsula will create the base. The center line has been marked and the slot is cut with an ordinary serrated steak knife.

positive. Now a question arises. Since you are under the impression from the beginning, not-realized, what you have backwards, or the shelf portion of the railroad ends up balanced over inverted upside-down? Well, I'll tell you.

Before I do, I'll tell you that I've been there! Even now, I'm not sure I've got it right. But I'll tell you what I've done, and you can decide for yourself.

Remember, I'm working on a shelf that is 24" wide. I've got a 1" x 4" (actually 3/4" x 3-1/2") for the center piece of spline and gluing the center piece into the slot. That's what you see here. Because the piece called for a maintenance grade (though the economics were very good in this case), it became apparent that this wouldn't work. We had to cut our opening in the base shelf wide enough to take the bit, so some inaccurate cuts resulted. Also, spline inspection. The contemporary pieces show how they were done.

Then, the centerline center spline was put into place. First two pieces of 1" x 4" were cut to length to fit between the uprights. The result was a piece of lumber approximately 46" long, with an irregular centerline. The intent in straightening the spline line is not giving an arbitrary piece cut to the desired length. Piece will straighten the spline and help it straight. It takes two or three pieces on each side to keep straight spline straight. Once the straight portions are set, additional spline pieces can be inserted into the curves to straighten them.

The first four feet of the shelf is also under lower than the remainder. The mounting holes must be in curve to the track. Once the location of the track was marked, we cut a slot wide enough to receive the whole rail (middle).

Remember what I said about doing the upper level first? Now comes the real foundation.

Where the switchback meets the base (above left) a directly over support. The slot has been cut with a router bottle in the middle of the cradle. The completed switchback (above right) reveals the transition to the wood part. Working on it around (see above) fo

wood work (below left) can lead to a nice final perfect surface in the completed and installed. This can be cured with a power planer and filling the grooves with filler or final. The final sub-installed (below right) as both big remaining railings will be filled with GRP.

We left the assembly where the wood of marine to make sure we liked it before we completed construction. We had short sharp bits of construction, before but we did not off the floor with a reciprocal workmanship. Everything had to be kept matching on every mm of the wood and the bit glue on a strip of hardwood, down how long, bend it in the other groove, who would then put it in place. As a result, the top railings now have three outlines. We knew from experience that due to the top railings

must stay in long enough to bond to with adhesive work.

Pieces of long winding up curved on centres. They can be cured with the help of a power planer. Obviously make sure the power planer that's over the already built material, and every. We worked slowly and out of the hole by the power cord out of the way. The bag attached to the planer and cleaned out as it kept the dust contained.

We ended up with several deep grooves in the sub-railing, filler wood

strips, we sawed in GRP Part 1 Part 2. One or a lightweight sanding compound that was the best to fill in the grooves. After an application, we sanded the area that when it dried. We have found away sure for that a Pilate on the railings. In one modern glass or acrylic balcony.

There is one special located on the other portion of the railings. The for a vacuum on that tank, made long that Pilate rivets and just to perform, as we could prove where the gaps would be and a ¼" hole was drilled through the rail rivetted a screwdriver into the central railings.

Leaving the rails overlaid and ready most spoiled using GRP that Part 2 caulking compound. The White Knot morning rails to this work order was. We packed the rails to the appointment shops at the weather. We did on the inside of the doors is almost not long as there were not to mind up the rails. We re-Engineering will present in the shapes we and then softened. The rubber line up to the workbench rockets was both screw gaps, there not at a later. Then would. Using hard with replaceable gaps were one to the straight minimum.

Making sure a level different as the part of the railroad. Brackets the the DIY and which machine known on supported by any tricks years very fast as as with the two rivets for rails supported by DIY as the two Engineers. The shelf brackets that support the

Building laminated sub-roadbed on a flat surface

The 2007 Fast 'n Final operation (top left) is spread along the sub-roadbed. Time will fill all the gaps. With the sub-roadbed clamped from the side (top center), the sub-roadbed is laid down and a 1/4" hole is drilled for the lower end of the switch machine. Next the rail including the switch is laid down (above right). The section of track is now operable (left). Using No. 6 drills, drain holes through the sub. Flat or finished ballasted base and top the grit with paint and cardboard strips. Flat scenery is with a sub in progress (bottom).

shelf portion of the material under the portland underlayer. The switch machine is hung on the front of the support brackets by one bolt to connect into the metal portion of the support. The two wires are held together by zip ties. The 3/4" holes in supported the metal brackets are then backfilled from the front.

Both the 3/4" and the switch machine holes are 1/4 gauge inch holes. We use what was because it is an inch easier to drill and widen. The places where the bolts are tapped to provide ground to the switch machines at the ends are supported by at least four inches to positively drain concrete. Every length of track between expansion joints has at least one set of feeders.

To a layer of small engines working up the concrete grades and around curves and back down, the Big Trains branch is a joy to behold. Now come the fitting of the fascia, last placing the cardboard in place, and working on the scenery. All that built in the down-on-down. The sky nothing more!

Remembering Russ Cain's "Buck Pass Railroad"

[illegible]

[illegible]

[illegible] ...ment was a lifetime NARA member and attended many National and Regional conventions. He built pieces of ornamental scroll NARA history. Ken became [illegible] ...ember. He also contributed an article to the NARA PUGET SOUND [illegible] ...ber 1979 about building ship [illegible] ...plan sheet. [illegible] ...ation.

Mark Post has been gone for many years but I still miss him. He was a very kind and generous man. I had [illegible] ...ship. I still have many of the old sailing prints, books, etc., and [illegible] ...ember a whole new beginning for Mark Post.

PRACTICAL BRM

DCC CONCEPTS POINT CONTROL

Howard Smith tests the Concepts' products for layout point control.

HOW I WORKED IT

CONCLUSION

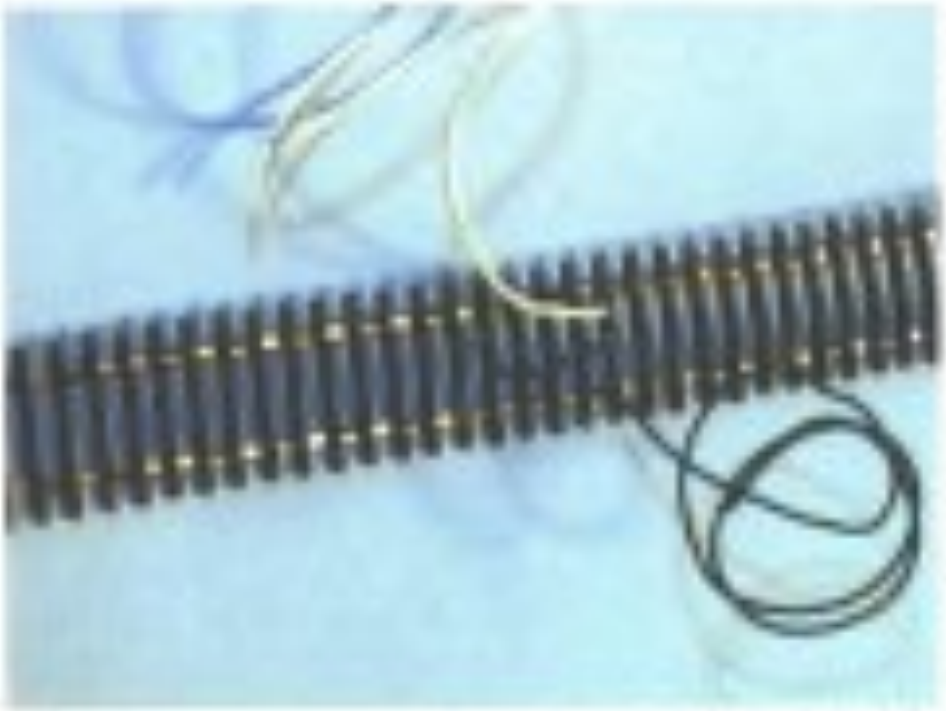
THE PULSE OF DCC

Hosted by Mark Jones

DCC Wiring for Reliability (part 1 of 2)

Everything in this article applies to model railroads using DCC or DC operation. Consider eliminating wires with a continuous, solvent-based primer system. With DCC, a reliable, continuous electrical connection is also important for the current signals to be sensed by the decoder and the train to receive instructions. If you are running sound-equipped locomotives, it is very important that the locomotive always receives power to the locomotive is uninterrupted.

Let's start with the wiring between your command station (which provides the power to the track and trains) and the layout. Most of us already thoroughly solder, including all wiring, track, and joint connections. Apply an ample of rosin flux and clean (also with water) to clean the track. Then, solder a #22 or #24 wire to the rail. Use a small gauge (#22 or #24) stranded wire for this. Solder a wire to each rail, and run these wires back to the command station. Use a different color wire for each rail. Use a small gauge (#22 or #24) stranded wire for this. Solder a wire to each rail, and run these wires back to the command station. Use a different color wire for each rail.



Own a piece of railroad history with the NMRA 75th Anniversary Commemorative painting.

In this specially commissioned painting, "Inaugural Moment of the Speedliner," renowned railroad artist Lowry Fisher has captured a monumental moment in rail roading history, a commemorative year...1938, the founding year of the NMRA. Now you can own a signed, numbered print of this magnificent painting for just $99.95* plus shipping and handling. Each print measures approximately 30" x 23", how the 75th Anniversary and Convention logos in the right margin, and is already wrapped for frame ready.

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*Price subject to change without notice. Limited and unsigned prints are also available for $49.95 each plus S&H.

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SHORT & SWEET

Post-1960s block height trains are too large for the average layout, but **Michael Brooks** has a solution – local trip workings hauled by Class 08 diesel shunters.

Loaded hoppers cross a bridge on a dark, rainy day on Alex Marchand's N scale layout. In this scene, Alex used a digital craft cutter (inset) to make the palm tree fronds, palmetto bushes, vegetation, and decals.

6 WAYS TO USE A DIGITAL CRAFT CUTTER FOR YOUR LAYOUT

It's similar to a desktop printer but cuts shapes instead

By Alex Marchand ■ Photos by the author

Whenever a machine can do something better and faster than me, I am a fan. That's why I decided to purchase a digital craft cutter. A digital cutter is a tool that has been around over an awful lot of railroading. It's similar to a desktop printer except it cuts material of various

Digital cutters are available in a range of prices. The highest-priced cutters can cut thicker material like 1/8" styrene and balsa. Cheaper models can cut card stock, transparencies, paper, and adhesive vinyl. Most digital cutters come with software for having one of their shapes letters, or numbers you want to cut out. However, some cutters don't allow custom cutting, so they're nearly worthless for railroaders. Make sure to research the cutter you're buying so it can do everything you want.

The model I own is a Silhouette Portrait cutter, and it works great for a cut cut stock material. I used how you will make yours if have yet my own digital cutter to look for its (inset). Obviously, you may think of it as basic cuts, especially if you pick up a more versatile model. [redacted]

Alex Marchand is a writer, artist, and private investor who models the Washington railroad region of Central Florida known as the Nine Valley.

Adhesive vinyl is a staple for making professional, durable signs. It's easy to work with for making durable labels for a model railroad. Fascia lettering looks great in adhesive vinyl. Here's how I made mine.

Using my digital cutter, I cut out my fascia lettering from a piece of white vinyl. After I cut the lettering, I rewinded, I peeled off the excess vinyl.

I then used my product called transfer tape, which is transparent, to pick up the cut lettering and place it exactly where I wanted. Once it's all in place, the lettering stays and the transfer tape peels away.

Palm fronds were my main motivation for buying a digital cutter. I designed the fronds myself. They were inspired by the way that of the South Models makes palm fronds, but they don't offer any to fit scale which is what I needed. Either case for the cut vinyl are cost-effective, except cardboard, stamp, and banana trees.

The one in the middle is a Washingtonian palm and the one on the right is a sabal palm. Both palm made from cut vinyl. I simply glued the fronds to and to form the top of the tree. (The other tree is a plastic one made from Super trees and trees.)

Cut adhesive vinyl makes great stencils, as long as the vinyl is able to stick to the surface you want to stencil, and it peels off cleanly after each. Adhesive vinyl stencils work great for painting letters, especially faded lettering, on rolling stock.

As you can see in the photo above, I used a cut vinyl stencil to paint this N.C. logo on this custom N scale Seaboard Coast Line phosphate hopper model.

If no sweat my custom for fully model custom decals. One method is to cut out decals from decal sheet film, but there is a limit to how small or just the machine can accurately make. I wouldn't venture into any complex cuts smaller than a half inch.

Letters with counters (shapes that are entirely or partially enclosed (as a letter, font), or symbols would be quite problematic using such a method. But for simple shapes like stripes, a cutter makes easier very useful details.

Know if a cutter is great to cut thick material. I can still cut veneers like custom miniatures. Once you cut the veneer, simply strengthen it with your material of choice, such as styrene.

You can go practically around (awning) like windows and doors with structural styrene. You can also double or triple up identically cut veneers by laminating them together to make the structure more rigid.

Digital cutters allow a person to take a custom-printed highway sign one step further by cutting it out with the precision control that only a digital cutter can achieve. Most digital cutters can cut out printed material.

PRACTICAL BRM

SPRAT & WINKLE COUPLINGS

Phil Parker shows how straightforward it can be to add these discreet couplings to your rolling stock

WHY 'SPRAT & WINKLE'?

STEP-BY-STEP GUIDE

Tool Car

Visiting the "Alternate" Tool Store

Figure 1

Figure 2

Figure 3

Color and texture, Part II

More aesthetic suggestions/**Bob Walker**

Scratchbuilder's Corner

Most model buildings have straight roofs, but tubular roofs (top) can add a different texture to a model and can be painted and weathered in various ways. Adding vintage bottle labels (above) is a good way to date a scene and introduce its visual interest.

PRACTICAL BRM

FOUR WAYS TO WINDERMERE

Layout design guru **Paul A Jarvis** suggests how compromise and creativity can help you to model a real location in a realistic space.

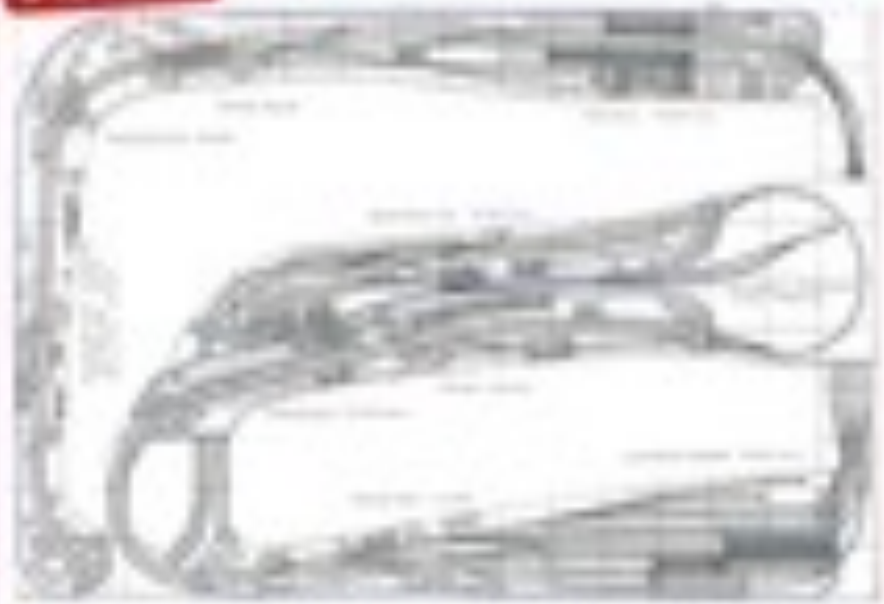
Artwork and photographs by the author

OPTION 2

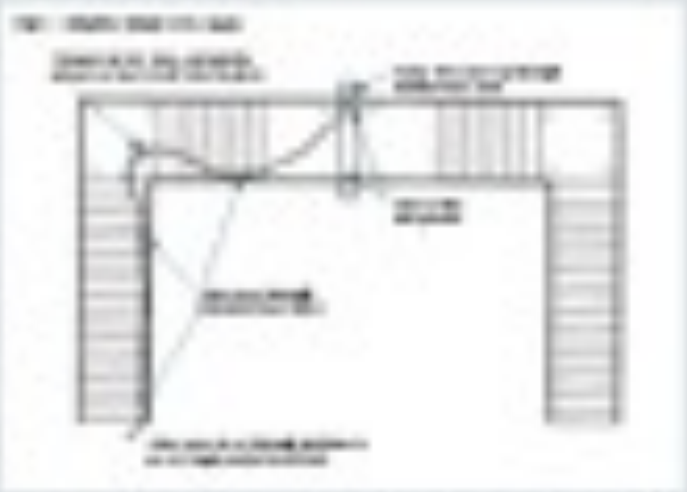
OPTION 3

PRACTICAL BRM

OPTION 4:



Crossing the tracks



FEN DROVE

The Arms can be very blinds in winter and it was assumed my mind to make this scene entirely in black and white, but I soon realised that this would be much harder than using neutral shades

KEY DETAILS

ROLLING STOCK

TOP TIP

VACUUM BRAKES

KEY SKILLS TO BUILD REALISTIC SCENES

I experimented with various methods for including fish and live eels were which, if any, was the most successful.

> **Every shop in the world is a potential source of model making materials and I particularly enjoyed going into stationers, newsagents and selling to craft jewels.**

Southern Crown runs E7B No. 101 and E7A No. 100 back up to Sou's Pennsylvania passenger train (photo). The E7s were constructed

dark Wabash front, a pair of Broadway Limited E7s models. Also servicing E7B No. 101 are outside the original brown (below).

Modeling an SCL E7B

A kitbashed E7 B unit to go with the E3SS A unit we built last month **Edwin Lupia**

Last month I rode a Broadway Limited E8 A-unit and matched another to, did work to. The Broadway Limited E8 set that I had ready with a matched B-unit. Unfortunately, the SR Brunswick stock all the Southwind I need. Less motive dynamo the one I am modeling, which left any with the difficulties of what to do with this shiny B-unit. After spending some more photographs I realized that I'm merging one set pieces like I did with the A-unit, the E8/B-unit could be converted into an E7 B-unit. The E7 B-units most left on the model is missing pilots, but I still am not modeling any. Fortunately I figured that out before I sent the pilots to the E8/B-unit—so I just had to add a little more artwork to my shelf.

Using a regular No. 4 pencil, the first thing I did was to mark out the panels on each side of the B-unit that were going to be removed. By counting lines to believe I didn't notice, I took all of the "shadow" that hobby way, adding duplication on to hand. That became the shape of a panel that might result in my being to rebuild both panels.

A little over half of the center panel where the portholes would be on most of the E7 B-units. I decided to remove the remaining center sections before my next

box and with my new, wide, metal screen I drilled holes on the inside corners of each panel being removed and then cut out the little pieces that were left with a sharp No. 11 hobby knife to make sure none could fall into the engine compartment.

There are a few places where there will be a small strip of plastic that remains in a mm. That happens between the upper louver sections and the center portholes window panels. Be very careful when cutting and sanding these sections. It would be difficult to repair that area of styrene.

I then cut all the remaining panels I used a sanding file and sanding sticker to smooth out the cuts and make the cut lines perfectly straight.

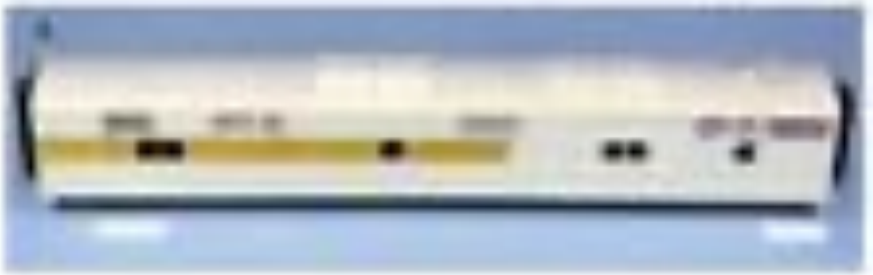
The next step was to add the grooves strips to the inside of the portholes that were raised openings. I used .020" x .040" styrene for this section. They will be where the brass panels are glued to. I like to use a liquid cement like Testors for this since it gives a very strong bond and has a decent working time, cement/plastic glue is good, but the working time is short. Once the

Modeling an SCL ETB

Three-bay Eastwood Coach Line (C) B-units were photographed while in service on Amtrak's Florida trains in the early 1970s.

1. The small strip angle that used to run between each door was replaced with a plastic fillet and then cab-height pilasters installed when cutting. 2. Small areas of the underframe were left intact to help maintain alignment and strength. Note that the cross-brace at the end of the underframe was also left in place. 3. Some of the underframe was left intact to help maintain alignment and strength. Note that the cross-brace at the end of the underframe was also left in place.

1 Since her nose-piece sit forward with sanding sticks and then a strip of styrene was added around the inside of each one. This strip acts as a shelf for the screen and the window/lamp panels to be attached to. 2 The window panels are attached accurately with cyanoacrylate. 3 The structural members, which were created with styrene strips, were brought to screen of the air intakes. The two cooling grills in the intakes were also created with styrene. Aluminum fabric mesh screen is used in the intakes. 4 This detailed view shows the location of the cooling grills as well as the structural members. The diaphragms have also been added as well as the diaphragm fill rings which were etched by the author. 5 The styrene cooling grills are placed before the intakes & which they will be mounted. The author also replaced the plastic fill rings on the roof with resin ones from Detail Associates. 6 Since they will be hidden behind the aluminum screens, the styrene cooling grills are not overly detailed. 7 The further locations have been added to the etched metal panels along with the electrical grills info.



two years. Now it's ready and awaiting some new unit here on the shelf of the curiosity. The resin ring which is attached to the fuel body plug's counterpart. The molecule on which the shorts that shall replace by this time on. I had to remove this ring from the drum. I was able to use only the resin piece and attach the ring to the bottom of the body. This is a little tricky and fragile on end, but once the model is assembled the last seal will protect the ring. I also removed the fuel filler, eight plugs and reinserted that on the shorts. I re-tucked this piece to the body with to the ring. Where the shorts were removed, two numbers just removed to allow to glue as don't worry about what to indicate the parts.

The last part to add prior to paint is the wheel covers. These can have any of brands which are available on the market these available models can. There are applied the same way to those on a scientific modelling number a comment. The frame is so superb, as a part as I just accepted those right as the frame.

I started painting the model now the decals had dried. I airbrushed the Polly Scale Shadow Black first. The whole lower half of the model was this paint and I also sprayed on and the frame as

Modeling an SCL ETB

Dave finished. I want consistency in details the first look to the three passengers. There will be an insert to cover the hole in the bottom in case anyone in the first shot.

I documented the model at each stage. The shots are so detailed that it didn't think it was possible to paint them and add a couple. I used the Tichi Video Black as the inside and the roof look. The wheel faces were painted Polly Scale Rail Brown, a light shading of Polly Scale Rail Brown on the brake gasket the end, green I rubbed down earlier when I was painting the body. Final splurge on the first look was provided by painstaking Polly Scale Engine Black, wherever the split was on the roof and that I finished the look with Testors Model Master Clear Gloss. I used Scale Value couplers with the top part cut off as well and it's painted.

This is probably the most rewarding part of engineer I have built in a long time. The use of the e-series, enhanced sounds and gave really made the project possible. Without these parts I would have produced much inferior model. Working comes that I can publish as regular in the Journal. Until then up the excellent for the future projects. There are no more engines on my list I promise. It wouldn't be an excellent work as I have. I was really looking forward to what comes next!

MRH $500 layout contest 1st place

Modeling a shortline for under $500

– By Eugene Griffin

Photos by the author

Reader Feedback

A BNSF crew is switching local industries in my home town. It inspired my present-era design, due to the variety of equipment still in service.

Model Railroad Hobbyist articles have inspired you, the photos in MRH blogs have awed you, and you want to give it a try.

Modeling a real railroad in a specific era

The budget and space certainly does not allow an entire class I railroad, or even an entire short line to be modeled (it would take at least 5,069 feet of track in HO scale to model a 100-mile short line, without sidings – well over the $500 budget).

Focusing on an era helps eliminate distractions when visiting the hobby shop. So now, no matter how great that 40' boxcar looks, if it isn't in service on the railroad during the era that has been chosen, it won't be purchased.

I won't mention the specific railroad I chose to model, because I may change my mind. I will say I chose a modern-era North American short line with 100 miles of track and a good variety of industries to model. It interchanges with two class I railroads and terminates in a small city.

Research

The decision to focus on the modern era and an operating railroad greatly reduces the amount of research time. Using the Internet and tools such as Google Maps or the Maps app on an iPad to gather railroad specific information can greatly help in researching the railroad.

My research focused the following questions:

- What route does the railroad follow?
- Does the geography change along the route?
- What is the track arrangement in general over the route? Location of passing tracks, interchanges?
- What towns does the track pass through?
- What industries are being served in what towns, based on satellite images?

- What are the track arrangements for those industries (if satellite resolution permits)?
- What motive power is being used?
- What equipment is being used?

After spending a couple of evenings "flying" over the short line using Google Maps and the iPad Maps app, I found the satellite images from Google Maps lagged the iPad Maps satellite images. A wood pellet manufacturer had added a siding alongside an existing siding, and an animal feed industry was built with a runaround track for that industry. The Google Street View image was newer, and confirmed the additional siding

2. The feed industry with covered hopper 0ef0 sitting on a recently built runaround track. Selecting to model between the building and the track, with the implied building in the aisle, will reduce cost.

and industry (the runaround siding wasn't visible from the street view).

After a week of on-and-off Internet searching, I had gathered enough information to start choosing what to model. I know the shortline primarily serves the lumber industry. It also serves a wood pellet manufacturer, steel beam fabricator, juice-based beverage manufacturer, animal feed and seeds

3. The budget will limit the structures used to model industries for now. However, this covered hopper unloading location does not require any buildings. To the left of this photo the track ends in front of the steel beam fabricator; 11 60' car-lengths to the right is the dirt ramp for a corrugated pipe manufacturer, and the beginning of the siding.

distributors, flour mill, chemical distributor, scrap metal yards, cement distributor, oil distributor, propane distributor, and a transloading terminal.

The railroad primarily uses leased GP38-2 diesels. It once had a leased SW1500 (Conrail logo still visible).

Satellite images may capture freight cars in the siding, and provide a clue about the length of the siding and type of freight cars used. As a bonus, Google Street View may capture freight cars at an industry or siding, and if you are fortunate, as I was, an engine crew switching an industry.

To help with modeling the railroad and designing the track plan, take as many screen shots and notes as possible.

Design

Let's start the initial design phase by defining requirements of the model railroad, keeping in mind the reality of the budget and space.

The design goals are:

- Point-to-point operation
- Modular design
- Easily expandable
- Easily transportable
- Industrial switching
- Freight yard
- One engine (GP38-2, hopefully)
- Modern freight cars
- Avoid compression
- Operational challenge

One design criterion I needed to allow for is modern-era freight cars. So, for now, I decided on a 30" radius curves for the main, 28" radius for sidings, and #8 turnouts.

My current residence has a den measuring 9' 2"×11' 7" with a large opening to a hallway on one of the narrow walls, leaving a 2' wall on either side of the opening.

I did a few iterations of possible designs, and the one that meets the above criteria with respect to benchwork is modules that are 1' wide, and a maximum 4' long. The length was chosen to fit easily into my car. Additional connecting modules will be designed to accommodate the curves. Legs will be used to support the modules.

I know that a point-to-point railroad with one engine needs a runaround track at both ends. I have learned from articles that multiple industries on one track can make an enjoyable switching challenge. I know I am attempting to model a real railroad, and that I have limited space and budget.

Industries

A runaround track to service an animal feed industry on the shortline provided the location to model. Just to the north, a separate siding serves a steel beam fabricator, a covered hopper unloading facility and a corrugated-pipe manufacturer.

Since I am trying not to compress, that will be it for the industrial modeling, for now. The freight yard will exist on the opposite wall and will serve as the interchange with the class I railroads.

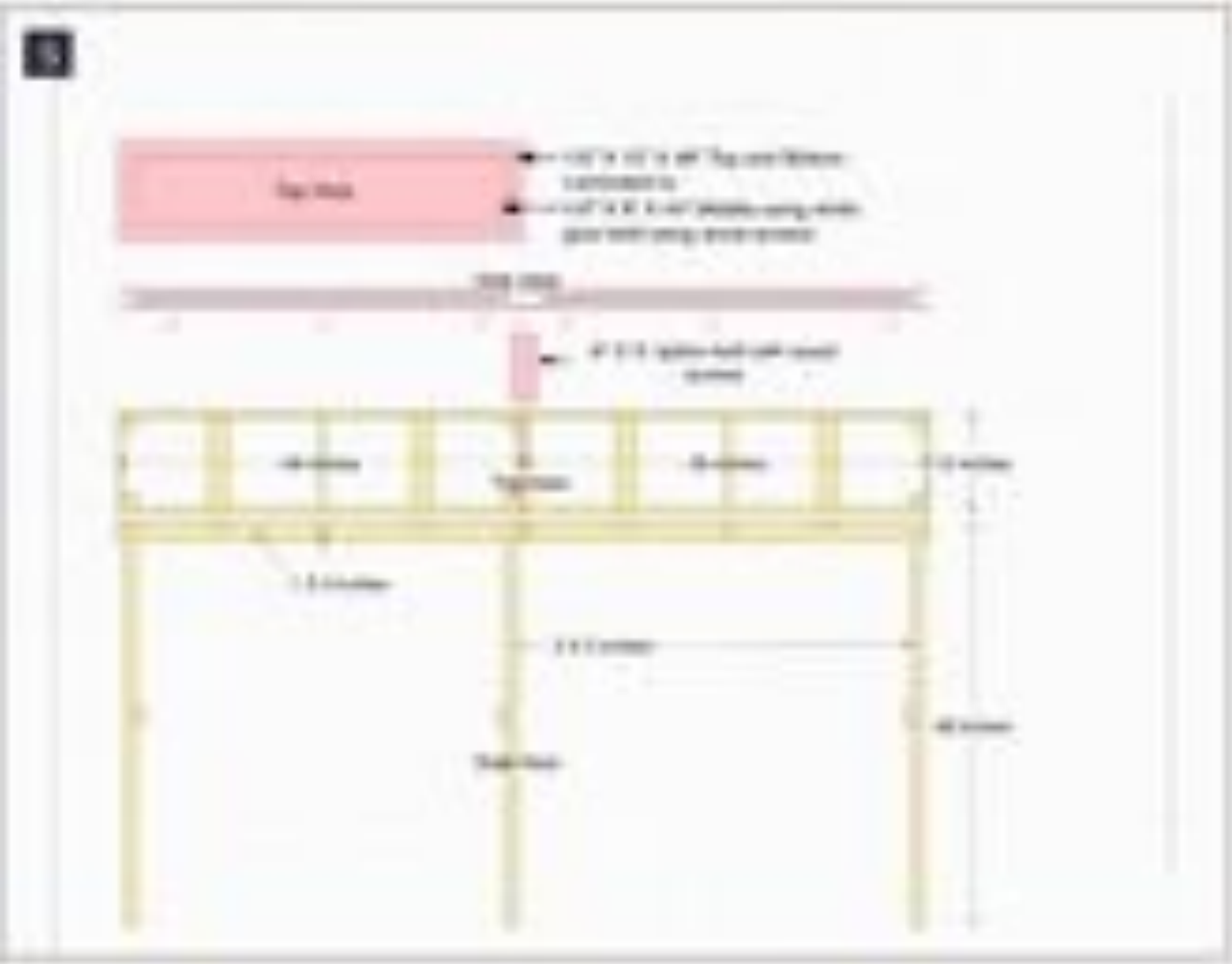
Construction

The benchwork can be constructed using a handsaw, utility knife, pencil, screwdrivers and optionally a hand-drill (to drill

4. The final design which represents four industries in a town, and the interchange with a Class 1 railroad.

holes for the wood screws). The one tool I have is a cordless rechargeable screwdriver and some hex-shank drill bits. This tool or a cordless drill will make construction easier. I selected 1/2" rigid foam insulation for the surface of the module, for ease of transportation.

Cut the 11 pieces of 8' 2x2 in half, for the 11 sets of 48" legs. Next cut six pieces of the 8' 1x3 in half, for the sides of the 4' modules. One piece of the 1x3 is cut into four equal pieces for the sides of the 2' modules. The remaining four pieces of 8' 1x3 are cut into 10-1/2" lengths, yielding 36 pieces for the cross bracing, five boards for each of the 4' modules and three



5. Construction details for the 1' x 4' modules

boards for the two 2' modules. Optionally, another couple of lengths of 1x3 can be purchased to add bracing on the legs.

To prevent damage to floors, cut some scrap cardboard boxes into 2" squares and wrap them in plastic wrap. Place these under the legs to catch any wood sap.

For the surface of the modules, cut one 1/2"x48"x96" rigid foam insulation into eight lengths of 1'x4'. The second sheet of rigid insulation provides the next four lengths of 1'x4', four lengths of 1'x2' and three lengths of 8"x4'. The remaining board will provide the remaining three lengths of 8"x4' and two lengths of 8"x2'.

Cut 4" off of each 8"x4' length, and off of each 8"x2' length, saving the leftover for splines. You should now have the following 1/2" rigid foam insulation pieces:

Quantity	Description
12	1'x4'
6	8"x44"
4	1'x2'
2	8"x20"

Laminate the sheets together by applying white glue to a surface of the 8"x44" section and centering on a 1'x4' section. Apply white glue to the exposed surface of the 8"x44" piece and place the second sheet of 1'x4' sheet on top. Use six wood screws to secure the sheets together until the glue dries. Repeat for the 2' sections.

Place each section (screws down) on the wood frames, and secure with wood screws. Trim the spline to 3"x8" and place in

the groove between each section, securing with wood screws from the bottom.

Electrical

I chose a DC power pack to begin the layout. DCC is more expense, not only for the power supply, but also for DCC-equipped locomotives. However, I do plan to switch over to DCC, and upgrade the locomotive to DCC. After the conversion to DCC, I plan to use the DC power pack for accessories.

The power pack (throttle) will be placed on top of the module on the shortest wall. This will locate it roughly in the center of this point-to-point layout. At first, I thought the location of the power pack would be an issue, but this will enforce operational practices by increasing time between the engine stop and turnout throws or uncoupling (I am not modeling a race track).

The wires will be soldered to the tracks on each module. A scrap piece of rail can be used to fish the wire through the insulation to the groove on the sides. The wires can then be run in this groove to the power pack. The groove can be covered with scrap rigid insulation, hiding the wires, but still making them accessible. For wire connections, twist the wire together and space-out connections to prevent shorts.

Equipment

I found an Athearn GP38-2 and three freight cars that would fit the remaining budget. Certainly used equipment is cheaper, but I like the new-equipment smell.

Expenditures

I was a skeptic about cost when I started. I thought there was no way I could model the short line I wanted on a $500 budget with the space I have. But I came in just under the target budget.

6. When the budget permits, the layout can be expanded to represent all industries in the town and elsewhere on the shortline.

Future

For scenery, paint and playground sand can be used initially, and then ground foam, static grass, and trees can be added. Some material can be gathered outdoors and used (with the appropriate preparation). Purchasing scenic material will go over the budget, but my goal was to get started with track, equipment, and benchwork, so a pink top is OK for now.

I am already considering expansion. A wood pellet manufacturer is the last industry in the town before the short line curves to the north, and then to the west. At that curve, on the east end of town, there are two tracks heading east that can be used for switching (these are remnants of a former interchange with another shortline).

The Atlas track and turnouts will slowly be replaced with hand-laid track. I will use the Atlas track in the interchange area, or in the new storage area under the bench.

The industries can be modeled with parts from kits, or with photo-mural techniques that have been written about in many articles.

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7. A wood pellet manufacturer close to the center of town has added another siding, shown here occupied with covered hoppers. The original siding is next to the building.

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Reader Feedback

Source	Item	Unit Cost	Qty	Total
	Framing			
Home Depot	2x2x8 wood for legs	$2.07	11	$22.77
Home Depot	1x3x8 wood	$2.12	11	$23.32
Home Depot	Wood Screws #8 1 1/2"	$3.40	1	$ 7.40
Home Depot	FOAM 1/2"x48"x96"	$12.98	1	$38.94
Home Depot	White Glue allowance	$3.00	1	$ 3.00
	Framing Sub-total			$95.63
	Electrical			
RadioShack	24 AWG 25 FT Red	$3.65	1	$3.65
RadioShack	24 AWG 25 FT Black	$3.65	1	$3.65
RadioShack	Solder	$4.49	1	$4.49
Hobby shop	MRC Railpower 1370	$59.98	1	$59.98
	Electrical Sub-total			$71.77
	Track			
Micro-Mark	Xuron track cutter	$16.20	1	$16.20
TRACK	Atlas 36" Flex Track	$5.99	15	$89.85
TRACK	Rail Joiners (24)	$1.83	2	$3.78
TRACK	Atlas Turnout #4	$16.99	5	$84.95
	Track sub-total			**$294.78**
	Equipment			
Athearn	GP-38-2	$84.99	1	$84.99
Atlas	Thrill 4750 Covered Hopper, First Union R	$17.99	2	$35.98
Atlas	63' Flat Car, BNSF #595515	$15.49	1	$15.49
	Equipment total			**$136.46**
Taxes and shipping are not included.	**Total**			**$498.64**

Eugene returned to the hobby after a thirty year hiatus. He very rapid his love of the hobby and unpacked the Athearn blue box kits that have followed him from childhood.

He built a switching layout but constant relocations for work resulted in its dismantling. Not let long the frequent movers deter him from his new-old hobby, he switched to inexpensive light weight modular designs that can be disposed of without huge financial loss.

He models a modern era shortline and looks forward to many years of enjoyable learning, experimenting and mastering the many aspects of this great hobby.

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PICAXE CIRCUITS FOR MODEL RAILROADERS

Part 1

– By Dave Bodnar
Photos by the author

Build a remote-controlled DC speed controller. Control animations or run DC trains, hands-off, through a pre-programmed route ...

PICAXE?

A PICAXE microcontroller chip was originally designed for students building simple electronic projects. The PICAXE system has now also been widely adopted by hundreds of thousands of hobbyists due to its ease of use. Each year thousands of high school students are introduced to electronics and microcontrollers by building a PICAXE project.

PICAXE chips are popular because they are very low-cost and simple to program using free, easy-to-learn software.

For model railroaders, PICAXE can be used to control and operate an endless array of things on the layout from simple animations to complex automated train display operation.

- See more at: picaxe.com/What-is-PICAXE •

Since 2004 I have been singing the praises of the PICAXE family of microcontrollers to fellow model railroaders through articles on my website (trainelectronics.com) and through presentations at national and regional model railroad conventions.

I have long wanted to put together a complete kit that would allow beginners to start working with the PICAXE while building a useful model railroad accessory. The new PICAXE 18M2 chip inspired me to write this article and assemble the parts for the kit that accompanies it. The completed kit is a full-featured

model railroad speed controller with many innovations and interesting features and capabilities. The controller can be used for other projects as well, because the it will work with any 3-volt to 35-volt DC motor.

Controller

The unit is a trackside power controller that can operate any model train that runs on direct current (DC) and draws 3 amps or less (this includes most of our trains and trolleys). It is operated by means of a simple TV infrared remote control unit. In its most basic mode, the controller allows you to increase or decrease train speed and reverse the train's direction with the handheld TV remote. This is an ideal way to operate the train under the Christmas tree! In point-to-point mode, the controller can be programmed to automatically run the train in one direction for some time, decelerate it, come to a complete stop, reverse, and continue in the other direction. This makes it a perfect controller for a small work train or a trolley. I also have plans to use one for my incline railway and a cable car (davebodnar.com/railway/incline/index.htm).

Additional modes and functionality can be added by modifying the PICAXE BASIC program to allow the controller to operate aboard a train or as a controller for animations.

Since it is able to control the speed and direction of any DC motor, it also can be used with any number of other projects including robotics, animation, and holiday exhibits.

Endless possibilities

A second article will show how a few components can be added to this circuit to not only control the speed and direction of a train, but also to record a series of movements over many minutes and

play back the same sequence of moves over and over. This is a great way to add variety to demonstration or self-running train layouts. I plan on using this controller to operate the layout we maintain at the Children's Hospital of Pittsburgh. Rather than just having the trains run in a simple loop, the controller's recording will have the trains running, stopping, and reversing.

Control options

One of the most difficult tasks one faces when designing a microcontroller-based device is creating a user interface that allows the operator to operate the unit with ease. Because the PICAXE 18M2 has the ability to interpret and act on codes sent from a TV remote control, the user interface can be both full-featured and easy to use. The remote shown in figure 2 is a Westinghouse unit that sends the Sony codes the PICAXE is programmed to interpret. Most Sony and multi-brand programmable remote controls will work. It is possible that some of the buttons will not match those shown here, but is it a simple matter to modify the program code to work with another remote control [3].

This TV remote control's buttons are used as follows:

- Channel Up – increase speed
- Channel Down – decrease speed
- Volume > or < – change direction
- Menu – stop, remembering speed, or start at the stored speed after a stop
- Return – enter configuration mode
- Number Keys 1-0 – enter configuration data while in configuration mode

Using the Controller

The video below shows many of capabilities of the controller.

2. Example Westinghouse brand remote that can send the Sony codes the PICAXE is programmed to interpret.

Playback problems? Click to try a different version

4. The 18-pin PICAXE 18M2, the brains behind the controller.

Hardware

A new member of the PICAXE family, the 18-pin 18M2 (picaxe.com/docs/picaxe18m2.pdf) controller, is an extremely capable chip that is well-suited to the demands of this project.

The 15-pin L298N H-bridge device is responsible for controlling the direction of travel and the speed of the train. It is called an "H-bridge" because such devices are frequently drawn on a schematic with four transistors in an "H" pattern (5).

I like to think of an H-bridge as a solid state double-pole double-throw switch. As you may know, a DPDT switch can be wired so that it delivers power to a train with one polarity in one position and with the opposite polarity in its other position. Reversing polarity reverses the motor's rotation.

The infrared commands from the handheld remote control are received by a small chip, the Vishay TSOP4838 (vishay.com/docs/82459/tsop48.pdf). Its small, boxy case and three leads belie its complexity. Inside is a sophisticated circuit that detects the 38 KHz infrared data stream from the TV remote control and filters it into a series of pulses that are interpreted by the PICAXE [6].

Other components include indicator LEDs, a voltage regulator, and assorted resistors, capacitors, and diodes. It is a straightforward circuit that works well with loads of up to 3 amps.

DC power is supplied by any filtered DC power supply providing 12–24 volts. I have had great success using old laptop computer power supplies for this and other projects. Be sure to use an appropriate heat sink on the L298N if current is likely to exceed 1 amp.

5. The L298N H-bridge, the "brawn" of the PICAXE controller.

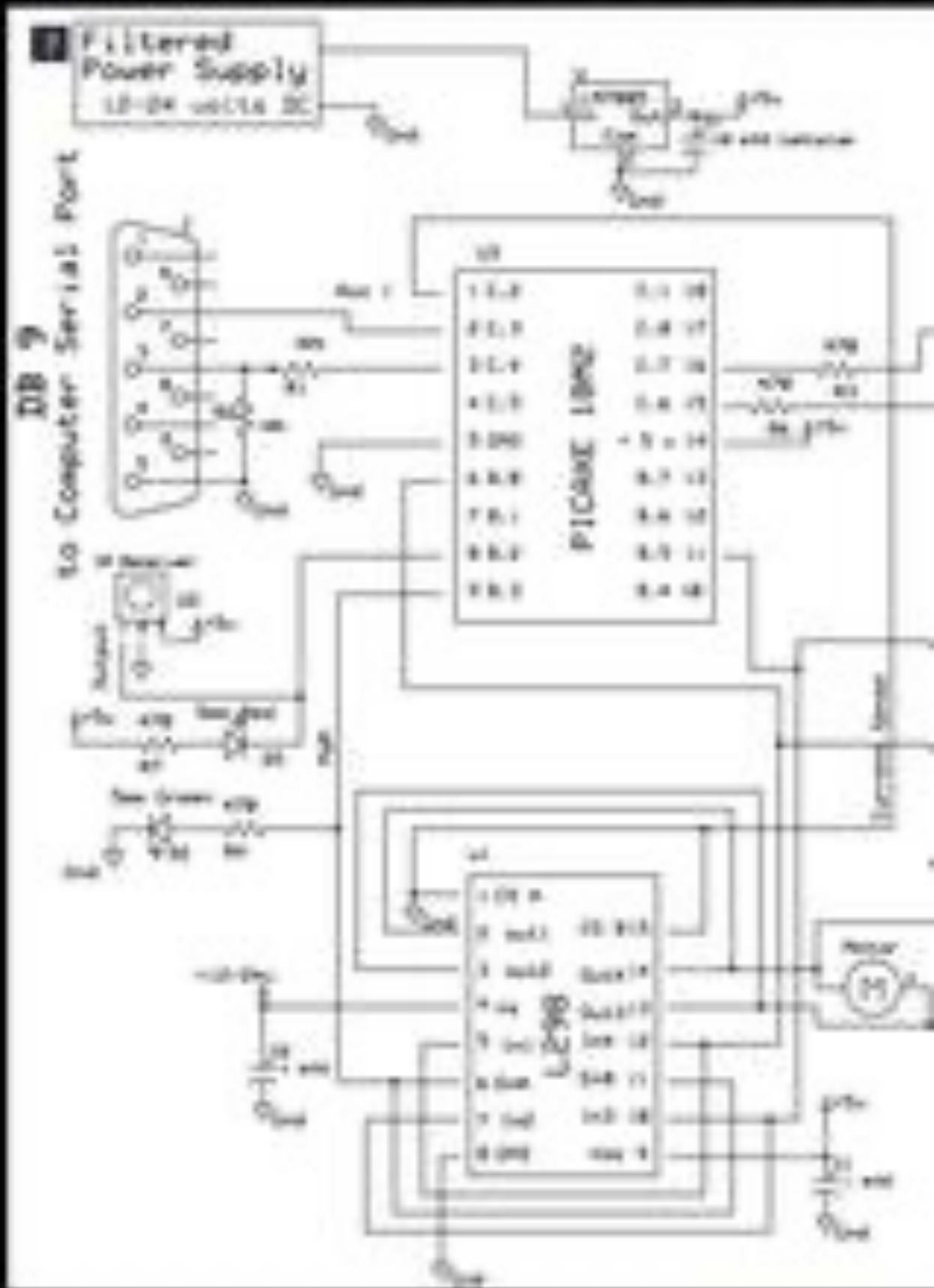
6. The small Vishay TSOP4838 chip receives the infrared codes.

How it works

The PICAXE is programmed through pins 2 and 3, which are connected to the computer's serial port (or to a USB-to-serial adapter). Resistors R1 and R2 and a DB9 connector are all that are needed to connect your computer to the PICAXE for programming.

Infrared pulses are generated by pressing a key on the TV remote control. These are received by the IR receiver IC and sent to the PICAXE through pin 6.

... On to next page of text →

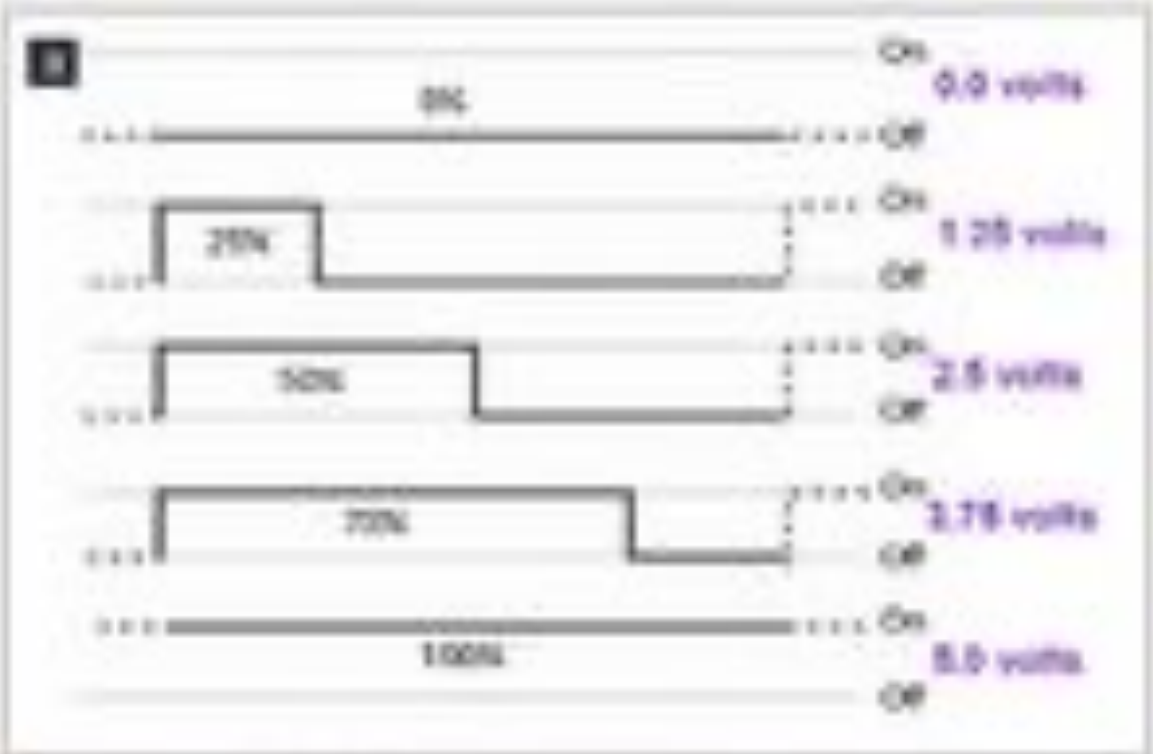

Filtered
Power Supply
DB 9
to Computer Serial Port
PICAXE 18M2
Motor

7. The PICAXE controller circuit diagram.

back to previous page of text ...

All power control is performed by pins 6, 11, and 9 on the PICAXE. These pins control the output of the L298N H-bridge. The L298N is designed to operate two separate motors, each drawing up to 2 amps. In this application we are controlling only one motor, so its control and output pins have been wired in parallel, to supply up to 3 amps of current to the motor.

When the PICAXE's pin 6 is at +5V (known as "high") and pin 11 is at 0V (known as "low"), the motor will rotate in one direction. When pin 6 is low and pin 11 is high, it rotates in the opposite direction. LEDs D2 and D4 light to show you which direction the L298N is set to.



8. How the PICAXE pulse width modulation (PWM) pulses simulate variable voltage.

9. The parts arranged near their locations on the circuit board.

The H-bridge spins the motor at full speed when it receives +5V ("high"), and stops it when it received 0V ("low").

But what about intermediate speeds? We don't want our locos running at full speed all the time! Microprocessors generally can't produce variable (analog) voltages, so they use "pulse width modulation" or "PWM" to achieve variable speeds. PWM sends a series of 5V pulses to simulate a variable voltage. For example, if the pulses are on half the time and off half the time, the pin appears to have half of the supply voltage, or 2.5V on it. Pulses that are on 25% of the time and off 75% of the time look like 1.25V, and so on. See [8]. (This is exactly how DCC decoders vary motor speed.)

Vacant areas on the board

You may be wondering about the unused areas on the board, those shown boxed in yellow above. These areas are for additional components used in the next phase of this project, where the controller is used to record and play back a train's movements. They will be installed and fully described in part 2. Stay tuned!

For detailed instructions on building, testing, and programming this circuit for the kit I sell, see my website at: trainelectronics.com/PicaxeSpeedController/article.htm.

In part 2, I look at how to do still more with PICAXE circuits for model railroaders.

10-11. The completed board.

12. Unused areas of the PICAXE controller board are marked in yellow.

Parts list and kit availability

The parts used to build the controller include:

- PICAXE 18M2
- 18 pin socket
- circuit board
- L298N H-bridge
- 7805 voltage regulator
- 4 @ 2 amp Schottky diodes or 1N4001 silicon diodes
- 3 @ 0.1 mfd bypass capacitors
- 4.7 mf tantalum capacitor
- 3 @ 5mm LEDs, red, green, amber
- 3 @ 3mm LEDs, blue, green, amber
- 6 @ 470 ohm resistors
- 10K resistor
- 22K resistor
- Vishay TSOP4838 infrared receiver
- 3 pin header for programming
- 2 @ 2 pin headers for power to track and DC power in
- heat sink for L298N
- fuse or poly fuse - 3 amps - either in the power supply or added between the power supply and circuit board
- TV remote control that can generate Sony codes ■

Reader Feedback

Kit available from the author

I sell a kit that contains all the parts shown in the article. Just email dave@davebodnar.com. All you need is a power supply and a motor to control. The cost of the kit is $65 + shipping. I can also supply a wired and tested unit, but I hope most readers will enjoy the experience of building the kit themselves.

Dave Bodnar's interest in microcontrollers, electronics and computers fits beautifully into model railroading and allows him to solve his and clients' model railroad challenges.

Dave has three railroads. The first is in the back yard, traversing more than 200 feet of track over two bridges, through tunnels and past a garden pond. The second railroad is an HO module he sets up at various train and community events with other members of the South Hills Model Railroad Club. His third railroad is one built by Dave and other members of the Pittsburgh Garden Railway Society at Pittsburgh's Children's Hospital.

His website, trainelectronics.com, contains scores of articles on his various projects. Many of his presentations are also on YouTube.

When he is not in his workshop, you will usually find him on his road bike traversing the back roads in Western Pennsylvania.

KITBASH A CRANE KIT

Tichy's 120-ton model is the base for Rutland's 60- and 150-ton cranes

By Andy Clermont

Photography and author ■ Illustrations as Kirk Johnson and Andy Jaeger

Materials list

Tichy Train Group
#6021 120-ton crane kit

A-Line
29009 Wheels,
33 brake gear rods

Athearn
Bottom from 200-ton crane (#1900 series)

Cal-Scale
220 cylinder
277 brake hoses

Detail Associates
1004 bolt (#004 pcs)
2006 short rivet bolts
2020 long rivet bolts

Grandt Line
5036 handrail wire

5053 lamp reflectors
(#454 pcs)
5058 3/32" handrail
stanchion set

Kadee
4 couplers

M.V. Products
304 18" brass chimney
parts

Plastruct
90360 1½" light angle
(#454 pcs)

Stycast
1 x 2 (4 pts)
1 x 4, 2 x 2, 2 x 4, 3 x 3,
4 x 4 strip (#360 pcs)
1 x 1, 3 x 4, 10 strip (#454
pcs)
2030 .250" sheet

Fig. 1 The granddaughter-in-law of Andy Chronnell, Rutland's founder, with the Rutland 150-ton crane from Industrial Locomotive Preservation Group's Rutland Railroad Project. Nearly 40 years in the making, the model is a faithful representation of the prototype, which was built by Industrial Brownhoist in 1928. The crane rolled on its axle-white tires, and a locomotive boiler without the use of outriggers. The Rutland's 80-ton crane was brought in to clean up the mess. Richard Limebaugh photo

My grandfather worked for the Rutland 150-ton crane during all of my childhood. As I've always believed accurate models of these really big machines have a special appeal to the grandkids, and considering what he was responsible for, I'm thankful that I never knew a time when I didn't have a model that was close enough to the prototype, and considering, almost like an overwhelming project.

I'd checked out the available plastic models and ruled them out because none closely matched the Rutland's 150-ton and 80-ton cranes. Then I came across a photo that made me think the Tichy Train Group kit could be a starting point for the Rutland's 80-ton crane.

Though they appear quite different, author Andy Chronnell fabricated both resin HO scale Rutland wreck cranes from the same Tichy 120-ton crane kit.

The photo above, **Fig. 1**, was taken in Rutland, Vt., shortly after the railroad received a 150-ton crane from Industrial Brownhoist. Story tried to tell a fairly light boiler without the use of outriggers (not called the same crane as the one).

The 80-ton crane that came to the scrap had seen sides and looked very much like the Tichy 120-ton crane. This inspired me to start looking through photos and records I had collected through the years, and I found that these models of the Rutland 80-ton and 150-ton can be made from the Tichy kit.

I was surprised to find the 150-ton crane had similarities, as it was built by Brownhoist, while the 80-ton was manufactured by Industrial Works. I discovered that in 1924, when the Rutland took delivery of the larger crane, the two companies were on the verge of a merger, and their designs were quite similar.

Rutland state history show that the Austin locomotive was close, with the 150-ton being 24 feet long and the 80 was about 18 inches shorter. I compared that to the Tichy 120-ton crane, which is 18 feet over the cast ally and decided to build both cranes.

I'll start by describing the changes required to model a 150 Rutland's 80-ton crane. The Tichy model is an excellent kit and easy to build if one sets it to scale. Most of you don't realize the that basic kit requires a right upon you start to the possibilities that kit offers.

Until Clement tries to others, it's where to acquire the Oglesburg & Lake Champlain Industrials of the Rutland RR in 1951 and

NO. X160, 150-TON CRANE

The chassis

Circa nineteen forty-two, built in 1942, served as the Railroad's primary break for more than 21 years and saved a congenial (and, like, also sure-shot 66 years of service. The workstyle was shorter than my kid, but I felt electrocuting the chassis by only a scale 18" wouldn't be worth the effort. Not only would it make the crew so too short for the 4 hours cab seems life, back, and trucks, but would look only slightly deformed.

On the kit, there's a mounting tab mounted at the centre of the cab roll above the swinging that isn't on the prototype. I removed it with a fine metal bit in a pewter tool mounted on a drill press, as seen in **Fig. 1**. I then cleaned up the cast face with a piece of fine sandpaper glued to a piece of hardwood.

The grab irons on the cab roll are also in the wrong location, so I filled the grab iron holes by pressing hypodermic pushrod sections, cut through from the back, then drilled new holes to match the prototype. On the cab roll, I added cut brass hand hook .016" holes and mounted six six holes and wire grabs.

I then cut and shaped the cooler cab rigger support to a 'V' shape with only one roller, as shown in **Fig. 2**. I used a 2 x 1 cut that number coverage on the five wire covers of the V to replace the one that was cut away. I then assembled the chassis according to the Tichy instructions and added a bell under the cab roll finally. I hung rail clamp chains on Detail Associates cut holes on the cabs.

Boom assembly

The boom on the kit was crane, while having the same shape as the Tichy model's, was lighter. It also had a pulley and assembly between the boom sides, with the pulley wheel removed to simulate.

To reduce the size of the boom sides, I first cut off the riveted plate covered boom. I then cut the riveted straps off the top and bottom of the boom sides (see **Fig. 4**) and used a file to narrow the boom sides to match the photos of the Railroad cranes. Then I glued the riveted straps and boom back together.

The other change is to the pulley. I assembled the to frame sick and boom sections but kept as more work. I then cut the rungs off the boom ironwork and bent, along with, I scale feet of the rod, and glued on 4 x (1) x .16 scale six 6 thirteen black between the I bum sections that had been cut off the rods, spacing them .10" apart. The other end of the scale and bent could be destroyed to 4 scale feet, turned on their sides, and glued on the top of the hook, as in **Fig. 5**.

I assembled the boom, connecting the wire bolt wraparound between the sides. I made a plate to cover the top of the pulley assembly using .040" styrene with rivets pressed in under the back with a pin. I assembled the primary hook according to the instructions, but the secondary hook must be cut off the "U" and attached to three holes of brass chain to make the prototype (**Fig. 6**).

The Railroad cranes are equipped with three lights on the boom for working at night. For the one on either side of the end of the boom, I used turned I one being white one, and for the floodlight under the boom I used a Model-Art light shade with an 81 Producer of .tmx.

Building the cab

Inclement weekends are cold, so to pass out the crane crew from the weather, the Railroad shop crew enclosed the cab. To model the cab I took stance of the builder's photos from both sides with a short flash and carried them to take.

Next, the cab sides (Tichy part name: bins #11 and 14) had to be shortened to match the other side of the crane. I made two cuts with a razor saw to remove the bent corners, one from the top to the lower head, and the other horizontal. I used the saw to remove a length from the cab so it would match the other side, as shown in **Fig. 7**. Once spliced it back on place. I cleaned up the seam with hypodermic pushrod and sanded it smooth.

Next, I narrowed the cab roof (or rock side by in scale inches by a scale length of 9 .5" starting from the front see **Fig. 8**). I then assembled the cab according to the instructions, but leaving off parts 8, 10, 19, 11 and 13.

Fig. 1: Milling cross detail. Andy used a motor tool chucked into a drill press to grind away reinforcement detail on the chassis side frames that wasn't on the prototype. He then sanded the area smooth.

Fig. 2: Modified rollers. On the 40-ton crane, there was only one roller on the end outriggers, but the Tichy model has two. Andy cut the center bracket piece to a V shape (right) and glued one roller mount at the bottom.

Fig. 4: Lighter boom. Andy modified the kit's boom (seen unmodified at top) by cutting off the face plate and rivet straps, then narrowing the sides with a file before gluing the rivet straps back on.

Fig. 5: Modified hooks. The Railroad crane's boom and hooks are rotated 90 degrees from the model, and are a scale foot shorter. Andy glued a block of styrene between the pieces to maintain proper spacing.

Fig. 6 Boom assembly. The boom is assembled with the Tichy A-bracing, a styrene saver for the torsion rods, and ramps for slight twists. The torsion rods lie between the boom sides.

Fig. 7 Asymmetrical sides. The Tichy model's cab has sides of differing lengths, but this finished cab is symmetrical. Andy used a razor saw to remove a section from the longer side.

Fig. 8 Narrowing the roof. Andy narrowed the cab roof by trimming 4" off both sides for a length of 8'-4". He kept the rounded corner of the roof to go above the side modified in **Fig. 7**.

I used .020" scrap to scribe the sides that enclose the cab. I cut a scale 4'-10" x 5'-4" sheet for each side and scribed lines for the door and access hatch, as shown in **Fig. 9**. An Xacto saber saw blade between the cab roof and floor. I notched a 2'-4" x 3'-4" area in the bottom side, but **Fig. 9** for the placement of the windows, doors, and details. I then glued the sides in place.

Details

Finally, I applied details to the cover once I was sure the Tichy kit, which you should, got where it belonged. I used .040" x .080" strip for the cab roof and .020" x .080" strip for the cab side backbraces, as was heavily weld-used to glue them in place on the bottom of the sides. Next, I added .020" x .080" strip across the roof as a drip edge over the doors. I also added grab irons, the headlight plates, and the air horn generators. For the horizontal shaped smoke stack, I filled a tapered piece of styrene tube with a scale 1" thick diameter plug.

I made the cab mirrors from .020" x .040" scrap, tapering the legs to match the curvature. I used Tichy brake cylinders and air reservoirs for the corner cylindrical objects that penetrate through the front of the cab. Once I glue the cab fronts in place on the cab roof, it will be up to Andy to finish.

I assembled the A-frame subassembly per the Tichy instructions, omitting the cylinders. I then left off the pivots rods and outboard pipes on that of the mainmast for the 60-ton crane and reused for one cooked by the cab fronts.

To properly space the A-frame sides, I formed the pulley brake air-hose sides, spacing them to match the boom narrower end, and glued them to a piece of .020" x .040" styrene strip, but **Fig. 10**.

Tichy recommends painting the major parts before assembly. I did that

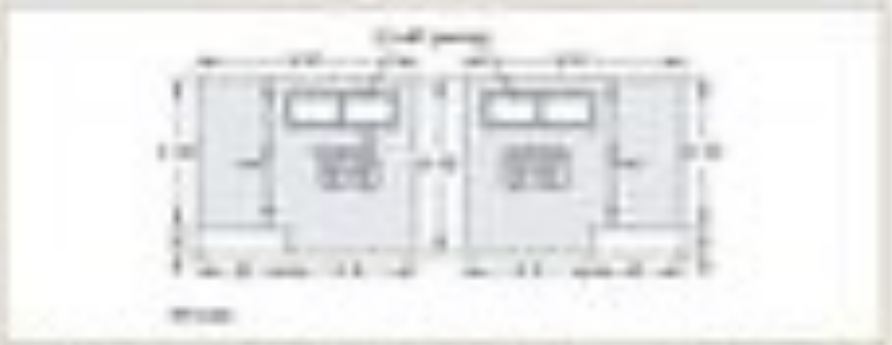


Fig. 9 New walls. Andy crafted new walls for the 60-ton crane's cab from .020" plain styrene sheet, according to this cutting diagram.

Fig. 10 A-frame stowage. Andy turned the short tension rod forks on their sides before mounting them.

Fig. 11 Wiring diagram. Thread the 60-foot crane's main cable through the pulleys according to this diagram.

next, spraying Floquil Engine Black first and then a coat of glue for a realistic surface for the decals. The decals I used were ready for Concrete Industries, an NYC hay that company isn't in business any more. You could go with current decals, or you can figure what you need from a white letter set. After decaling, I sprayed the painted plastic with Testor's Dullcote and lightly weathered the parts.

I assembled the crane following Tichy's instructions but wiring the boom as shown in **Fig. 11**. To hang the cables neat, I made a miniature hook a bulldozer part spring. I attached one end of the spring to the center knot inside the A-frame and the other end to a string attached to the bottom brace at the rear of the boom.

The final step was to add window glazing and the cab front glazing. I also added hooks for storing cab tools, chain, and hydraulics.

Detailing the chassis

The crane boom/jib/mast had increased in weight and was by 1959 the Bedford decided it was time to go shopping for a new crane. This time they went to Industrial Locomotive for a 150-ton model. Again, it's useful to note this in years following the Yard's restructuring, ordering changes at one go.

Beginning with the chassis rails: I drilled the grab-rail holes for pinning (location point) through from the back. I'd have to hold a bar(s) down on the rail surface while I was drilling each.

Fig. 12 Outrigger brackets. The Bedford's 150-ton crane had brackets for the outriggers at the ends of the chassis rails. Andy carved his from scale 3 x 4 styrene strip, as shown.

The outrigger box brackets at the ends of the rails are to support the outriggers. These supports are shaped as shown at **Fig. 12**. To make sure all these supports have the same contour, I arranged eight pieces of 3 x 4 styrene strip together, then used a file to shape them all identically. I cut them to the same length and glued them between cap and bottom braces made of 3 x 4 styrene strip. Their correct positioning is shown on the model in **Fig. 13**.

The end 3 boom outriggers also needs reinforced support. I added reinforcing ridges of 3 x 3 styrene to the swivel-end outrigger (Tichy part number A 4).

Next, I added wire grab irons to the side sill and glued them from the back with cyanoacrylate adhesive (C.A). I detailed the ends with wire grab irons, eye bolts, brake levers and chains, just one bolt for each clamp. The placement of these details is shown in **Fig. 14** along with an extended 4.4 reel.

Fig. 13 Bracketry installed. This photo shows where the outrigger support brackets, carved from 3 x 3 styrene strip as seen in **Fig. 12**, should be added to the chassis.

The last change to the chassis is to move the pedestal that the crane body will be mounted on. The only thing I could find with a 1'-6" outside diameter for the scratch pedestal was a plastic pen sculpture bottle, but it worked nicely. I cut it to the height of 9" with a razor saw by spacing the set blade a scale 4" above a flat surface and clamping it securely. Then, I turned the jar along the blade as they are as shown in **Fig. 15**, giving me a level cut.

I sloped the pedestal with an 8 scale inch thickness disc cut from 040" sty sheet. After gluing this assembly to the center of the original pedestal, I drilled a hole through the cranes so which I'd later mount the 'n frame.

Boom and A-frame

The boom supplied with the kit doesn't look hefty enough for the 150 ton crane, so I substituted a boom made from parts of an Athearn 150 ton crane.

Fig. 14 Kit details. This view of the finished 150-ton crane and, along with an uncredited kit and plate, shows where Andy placed wire grab irons and other details.

Fig. 15 A shows above. Clamping a razor saw blade a scale 6" above a level tabletop let Andy cut the bottom off a prescription jar precisely and evenly. This round piece became the 150-ton crane's pedestal.

Fig. 16 Boom/block/A-frame pulley bracket. This assembly, made from the Tichy A41's pulley wheels, .030" sheet styrene, 4 x 4 styrene strip, and nut bolt-washer castings, makes up the crane boom tension cord fork.

Fig. 17 Boom detail placement. The reconfigured boom detail includes, from left, the Tichy cord fork, styrene cross bracing, the vertical primary hook pulleys, the tension rod fork, and Tichy A-bracing.

I split the adhesive down to bolt, drawing the X-bracing, and dismissed it for I was not at the best. I reassembled the boom using the aluminum bracing, the Tichy mast and mast-tension spreaders (parts M1 and M2), and the Tichy X-bracing. Next, I destroyed the top X-bracing by cutting it with a saw off the top and re-soldered the boom to the bottom and pulley-wheel bracket.

The boom-to-mast roof bolt was bolted down with screws down, in a 4 mounts only, a pair of 4" mm bolt number coverage, and the Tichy pulley wheels as shown in **Fig. 16**. This bolt is attached to the top of the boom on a bracket. I built the boom down with screws using the Tichy pulley (parts M and M1) as seen in **Fig. 17**. I bolted the end on the mast with 2 x 4 screws with many grooved as mine, the back and Tichy's books and boom top casting (part M). I study the double-sided hook from a piece of the plastic sprue from the kit.

Next, I assembled the A-frame, with some modifications. First I sanded the side's parts (A and B). I cut off the bottom boom sections and added new ones fabricated from .030" styrene and trimmed with 2 x 4 strip.

Fig. 16 New boom-base mount. To fit the modified Athearn boom, the A-frame sides (part numbers A-1 and B-1) need bases; jaunting-shaped beam mounts crafted from .020" sheet styrene and trimmed with 2 x 4 strip.

Fig. 17 Replacement mast. The worked roof of the Tichy cab must be cut out to make way for the one that mast. Andy made the new roof from .020" styrene, embossing rivets into it with a pin and adding the kit mast.

Fig. 18 Cab boom mast added. Andy built a scale 1'-0" x 1'-0" x 1'-0" styrene box to give strength to the shortened and modified cab. The Tichy cab sides will be hidden behind the scratchbuilt sides, but are needed for strength.

Fig. 19 New sides. This diagram shows the door and window placement for the new cab sides Andy made from .020" styrene. He avoided the Tichy sides that was laminated the new sides over them.

Cab modifications

To build the cab, I started by removing all the detail from the outside surface of the cab's right side. (Tip for your use, it's I sanded it flat and cut off the portion that extends forward, along with the floor. Next, I trimmed the left side to be a mirror image of the right.

Figures 18 shows the new cross roof that I made from .020" styrene sheet to replace the original, which I cut out and discarded. I scribed panel lines into the styrene and used a pin to add rivet detail.

I then built a rectangular styrene frame, a scale 1'-0" x 1'-0" x 1'-0", and topped it with .020" styrene sheet to make a box. This would become the new roof base of the cab. I glued this box between the sides, as shown in **Fig. 20**. I then assembled the rest of the cab, but left off the roof, cab-rear walls, and roof panel (part L4). I replaced this panel with one made from .020" styrene.

After test-fitting the cab on the A-frame, I glued a 4 x 4 scrap strip to the inside back wall of the cab, spaced just far enough down the face to act as a pocket for the rear of the A-frame. I filled the rear face at the sides of the roof with .020" styrene shaped to match the contours of the roof.

Next, holes of .410" styrene sheet over the new cab. After scribing panel and cutting window openings as shown in **Fig. 21**, I glued these sides in place.

Utilizing the windshield from the Tichy cab, I sanded the bottom smooth and flattened a pair each from a scrap of brass tube. I added a wiper and grab irons to the cab.

I painted the cross Chapel Engine Black before final assembly and decal and a variety of colored lumber decal on me. And, finally, I followed the Tichy instructions for arranging the cables and added boxes to store the wires for hoist, boom wires, and handwinches. ☐

An A.R.M.S.-era G.N. car in Glacier Park (Tim Doyle) a mix of newly constructed plywood and steel cars in the mid-1950s. Photo courtesy Jim Scribbins collection

The Great Northern's plywood boxcars

With steel needed for the war effort, these boxcars were given plywood sides. **Stefan Dinkum**

The cold days of mid-1942 finally brought several plywood-side boxcars pulled by ex-A.R.M.S. car 4777's to assign and group and with a bright red plywood caboose road out into the Great Northern system, not simply to see something happen passing the sides of glass because enough in other words but because World War was still raging!

The scarcity of steel for peacetime purposes during the war certainly was the major reason for the plywood experiment. Between the 14000-14999 series of plywood-side cars also illustrated the conversion of materials as the availability of steel. While the first 400 cars built in 1942 also had plywood construction in the sides and roof, changes in the specifications for the rest of the series involved all-steel sides and roof structures.

A factor that made the GN car most constructive began that steel needs a door for boxcar cars from Oregon and was designed for the outbreak before that turning to use common made for shipment of steel from the East.

By 1942 the GN decided they needed another 1,000 boxcars when reports that were being the remainder of the 14,000 cars 40-foot, 50-ton, single-sheathed, double-door electric boxcars built during 1941 to 1942. These were purchased from commercial builders, which had opportunity here the most favorable terms at the time. But now, in 1942, a new board that "cars can be easily wired in any way design at low cost type of purchased from the builders."

It would take until 1944 before the cars were built. Business shortages and fuss delayed the project. The use of plywood was advertised as representing personnel conservation, and are intended to be exchanged for steel after conditions cleared and steel became again readily available, again 1943. Many eight cars from Douglas of something with steel cars among GN arrangement.

It was also decided that all of the cars would be equipped for two-position service. One of these was the second to each allowance, beyond the 1940. The remaining 14 original boxcars received numbers 4000-4013, and were all plywood construction like the 400 freight boxcars, but slightly wider.

The engineer between completed boxcars, Hunt Transfer to St. Paul Central under with Yakima motor bearings. They were equipped with a simple truck bar, an agency bar, double-wheel cars and operating mechanisms, with 36 x 8 car bodies.

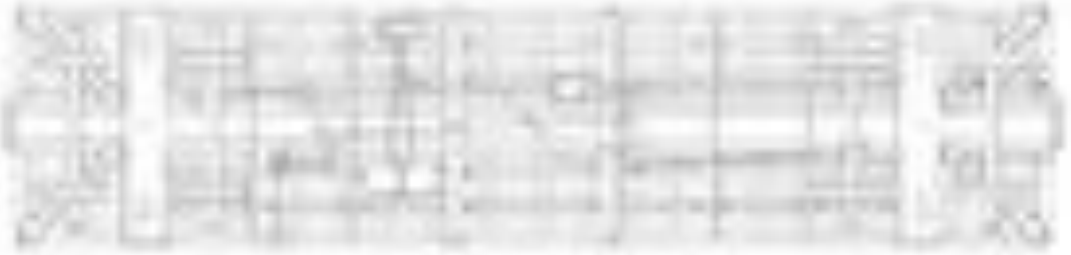
The cars were built in the Great Northern shops at Hunt Park at St. Cloud, Minnesota. But by the end, structure material used, that were all 1941 built standard box cars with a 10'-0" interior height. The under-frames were fabricated at Hill's frogs at Minnesota shops and were welded

GREAT NORTHERN

The Great Northern's plywood boxcars

Roof view

GN 36000-36749 series boxcar



Wood stringer underframe

GN 40000-40899 series boxcar

type[1] reference lettering. Double doors two feet wide were of orange colored boxcars and the plywood-sheathed variants were in the gallberry cream painted by the FY on the cars pictured. Many of that color were many of the earlier numerous GN box but with creosote treated cars. They were to last to the lowest door sizes of to GN base. The gallberry plus mottle look the car color more natural painted the cream orange as used on the doors, and yellow as stated in a 1940 Pittsburgh Paint on their equipment to the World of 1940's Railway Age page 69.

In November of 1954 it was decided to build another 500 new 'x' motor design and specifications as the 1,000 car being built at St. Cloud Shops. In effect making the additional 500 boxcars to be considered of greater boxcar building

pregnant," according to a letter from Mr. F. H. Hulse to GPE Administrator Mr. Nolan, dated the 1st. March. The car-making was first begun experimentally last year, some time during or after 10,000" to 1941 despite the model "gondolas" cars and the 1,000 Ohio-railroad gravel-side cars added after 1940. In addition, according to unsigned memorandum, a set of blues was given "less than 1,000 cubic capacity making them unsuitable for gravel hauling."

When the GPE could secure this gravel, its build plans were on the priority position of Defense War Production Board, and the Office of Defense Transportation required whether they might build the cars earlier in case the War Board decided "since the whole loading in the northwest was the most urgent requirement for shipping." As a reason was a series of loading delays, shipments delayed the delivery of gravel, and the cars were not completed until February of 1943.

Writing planning for these cars here was a suggestion to use it for the steel to the manufacturer and to the mining branch. The GPE bill was the extra 150 dollars per car for the modification was not made to the first most for the re-

ory 26 dollars for the missing guard removal "it will save a lot of repair costs, which is quite an item on mining trucks are clearly intended for the first cost, maintenance cost, even for heavy loads (GPE)," allowed to the time each 10 cars had been made under more re-

sponsible terms of the underframes. The cars had to be called back to be in the former underframed.

Among the papers is why the GPE so was known to J. Edwards to state what been "Mr. F. H. Hulse to Mr. J. H. Pratt "The Carnegie Illinois Steel Corporation

The Great Northern's plywood boxcars

Painting and relettering

When was the color of the original car body painted orange with green roof and lettering. The "brake" red

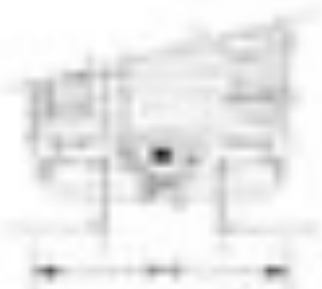
Drawn by Jaime Urbanet **Full size for HO scale: 3.5mm = 1 ft; 1:87.1**

Gbs 245-2024 series sliding wall car

Gbs 245-2024 series sliding wall car

Gbs 245-2024 series sliding wall car

Front hook and signal line layout



Gbs 245-2024 series sliding wall car

Parties end view

The Gbs 245-2024 series sliding wall car was introduced in 1924 and was used to transport grain and other bulk commodities. It was also used to transport other goods, such as coal and ore. The car was designed to be loaded and unloaded quickly and easily, with a large door on each side and a hopper in the center. The car was also equipped with a brake system that allowed it to be stopped quickly and safely.

The Great Northern's plywood boxcars

The 40760 (above) is one of the 100 36-ft outside-braced automobile cars built by the railroad in October 1941. The road name and monogram are notable since what was used on the single-door cars and box cars were Scandinavian. On the original prints it was clear that the light tangerine of the side sheet and green on a contrasted with olive-drab ends. The 40714 (below) was repainted several and, surprisingly in November 1950. The 40760 series declined from a different looking than the more boxy plywood construction from the years during the 1940s. This series consists of 4001-4400 vintage double-sheathed cars rebuilt with plywood sides in 1944 and 1945. The sparkling features are the indented corners and the two rounded vents in the sheathing. The 40476-40575 series had two perpendicular seams

1950 1970 and received numbers 4700-4725. They were repainted in the Big Sky Blue paint scheme.

The cause was simply one more short shopping in 1960. It formed a record of lined and was painted Oxford Green. A later conversion consisting program for 40000-40399 cars and the 40400-40499 series was the cars welded-steel, and the 40400-40499 series in 1967. Both these sides and 40% cars in the 40400-40499 series in July of 1970 and one car by the 4700-4724 series.

Modeling

Modeling the 1/8 plywood-side cars in HO scale was quite easy since parts were already available. Kadee offering 36 mentioned interesting interesting subjects of cars but the latest cars and 40000 cars cars. The latest series could be modified using the Kadee or improved Intermountain doors. The

Acknowledgements

I would like to thank Stuart Richmond, of the Great Northern Railway Historical Society archive, for providing some of the photographs.

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Protecting a layout entry gate, part 3

Mike Polegrese wraps up his three-part series on protecting a layout entry gate by describing how the programmable Iris Mini Panels and sound decoder. Previous in this series:

In the last two installments of Iris Circles I described my passive (no battery) entry gate and how I wired the rail with panels. Now, in the final installment of this three-part series, I'll describe how I programmed the sound decoder and Iris Mini Panels.

The main job of my gate is pleasant enough, but I'm sure that the user who is a client called Rocky Run runs a bridge crossing the Willamette River. I need those sounds consistently while driving and programming (several of a session's visits). Long live cruise and only audio provocations! This helps me keep things straight.

Programming the sound decoder

Programming the Digitrax DH163PE sound decoder proved to be more of a challenge than I anticipated. I wanted the sound of a crossing bell instead of a locomotive bell used in most decoders. The Digitrax decoder allows the user to add your own WAV sounds with several pros and cons, as I described the bell tones in my N-scale crossing. Tomorrow, I had trouble understanding how to load the sound into the decoder. I searched the Digitrax Yahoo Group archives for help and found a reference to Mike Miller's Sound Project Helper (www.bdmiller.com/sound_project_helper.html). Mike's work with sound decoders was featured in the May 2013 issue. ... Duh.

I converted the bell recording into an 8-bit, 11 kHz .WAV file using WavePad, a sound editing program from NCH Software (www.nch.com.au/wavepad). In addition to converting the file, I edited the recording down to a single ring of the bell, making the file small enough to fit in the decoder's onboard memory.

Where I ran up the sound project using Sound Project Helper, shown in **Fig. 1**, I ran the bell in loop as long as F1 was activated. I kept the default Auto Start-Delay-Different (Type-4) function since I wanted to simulate the gate. I set up F1 to sound the horn as the grade crossing sequence of two longs, a short, and a long. The horn sound is made up of three parts: attack, sustain, and decay.

I made the horn blasts for the grade crossing cadence by looping the sustain section two different lengths of time. The software walks you through the process of making a sound project and converting a .wav file like the bell to download into the decoder. While setting normal configuration variables (CVs) can be done with any digital command control (DCC) system capable of programming CVs, downloading sounds requires a computer and either a Digitrax PR3 or PR4 programmer.

The Digitrax dock light effect I used for the crossing lights is designed to operate when F8 and F9 are activated and can't be changed. Function 2 (F2) is the default horn function. Since I wanted the lights to flash independent of the horn, I swapped the horn to F1. To activate the flashing dock lights, I programmed CV#49 to #4 and CV#50 to #37. The values of the bell, crossing bell and sustain are set to CV#51, CV#52 and CV#53, respectively.

Programming the Mini Panel

The crossing bell and flashing lights work when a train enters the detection section on either side of the gate. Once a fixed period, a locomotive horn blasts a grade crossing cadence which repeats until the train clears the detection section on the other side of the gate. Because someone else owns the gate, when the crossing is activated so a train can back out of the block and enter track the other side. I programmed the Mini Panel to cover all possible aspects in all modes.

The Mini Panel has 16 inputs. When an input is activated, the Mini Panel can execute up to four DCC instructions, such as switching a locomotive and programming a set of locomotive sound/effect tones. These can be put together to form a sort of computer program.

The Mini Panel also has a set of two CV#1 commands that control the flow of the instructions executed. CV#1 three, 1 sound load, drop, and delay.

"Load" allows the computer program to jump to another input's set of DCC instructions. The second input's decoder can't signal doesn't need to be connected or activated when activated by a train entry mode. In the load command to point the first input is needed to add those inputs

Fig. 1 Cautious sounds. Mike used Fred Miller's Sound Project Helper software to transfer the sounds from a real grade crossing into the decoder. The software allows Mike to assign function keys, sound clips, and configuration variables.

Fig. 2 Junction City Mini-Panel program

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A left coast couple of my readers and I returning to the scene of Boise Cascade's log loading operation at Elbow Cove, Idaho. The evening signal lights were intentionally "underexposed" placing us on the edge of the foreground and rendered slightly out of focus using the shallow depth of field of a 135mm telephoto lens at a wide aperture to give the eye back to the long train ranges behind. Purposely shooting from a low angle on the "dark side" of plane the two standing men behind the train created the sandwiched Cordova & Yakutania passenger train leaving Chena, Utah, on a moonlit silhouette (Bottom).

A Wisconsin winter scene as we say so right.

Post processing, but no more photographers. Shooting shots on the left side is unnecessary and took an extra step or two to accomplish. Wide angle or telephoto acceptable. Shooting shots on the left side is unnecessary and took an extra step or two to accomplish. Wide angle or telephoto acceptable. Shooting shots on the left side is unnecessary and took an extra step or two to accomplish. Wide angle or telephoto acceptable.

The Basics Shot

The goal of the basics shot is to show in one image all details of a locomotive. This will require shooting at least one locomotive from each side, and a front and rear shot to showcase those shots. Shooting shots on the left side is unnecessary and took an extra step or two to accomplish. Wide angle or telephoto acceptable. Shooting shots on the left side is unnecessary and took an extra step or two to accomplish. Wide angle or telephoto acceptable.

Although full sunlight is not pictured here, the reservoir lighting works well with the standard 'in sunlight' interpretation called for in caption. Use one of foreign planes showing a level daylight as Mount Crushed Gold was in daytime. Jim

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Notes from the MRH Staff

MRH now #2 – passing up RMC, $139 tablet for reading MRH, TMTV: New module-building series, and more ...

MRH now #2 – passing up RMC

This little magazine venture of ours, that we started back in 2009, has grown so it now appears we've overtaken *Railroad Model Craftsman* in circulation. Per the measures we list here, it's safe to say MRH has become the number two general model railroading publication in the hobby as to audience reach.

Let's take a closer look at the numbers. Many of these stats you can check for yourself. To make it easier for you to see where we get the numbers for MRH, our annual audience statement is on the following page.

CIRCULATION AND SUBSCRIBER NUMBERS

Here are the numbers each magazine reported as of January 2014:

Model Railroader:
131,981 total paid circulation;
97,940 total paid subscriptions

Railroad Model Craftsman:
41,177 total paid circulation;
21,973 total paid subscriptions

MODEL RAILROAD HOBBYIST MAGAZINE

STATEMENT OF OWNERSHIP, MANAGEMENT, AND AUDIENCE[1]

Title of publication: Model Railroad Hobbyist Magazine

- ISSN: 2332-7421

Date of statement: 1 February 2014

Frequency of issue: monthly

- Number of issues published annually: 12
- Lifetime subscription: No charge (just supply email)

Location of office of publication:

Woodburn, Oregon 97071

County: Marion

Names of publisher, editor:

Publisher: Joe Fugate

Editor: Joe Fugate

Owner: Joe Fugate

Known bondholders, mortgagees, and other security holders owning or holding one percent or more: none

Extent and Nature of Audience[2] as of Feb 1, 2014

Total monthly unique device views: 111,111 (based on unique IP)

Total monthly unique users: 73,333 (determined per IAB guidelines)

Total monthly website visits: 212,208

Average duration of website visit: 7:25

Percentage of OS/devices used to visit:

Windows: 64.4%

iOS: 15.8%

Macintosh: 10.8%

Android: 7.5%

Linux: 1.3%

All others: 0.6%

Percentage of browsers used to visit:

Internet Explorer: 26.9%

Chrome: 24.4%

Safari: 22.1%

Firefox: 20.1%

All others: 6.5%

Total mailing list subscribers: 28,605

I certify that the statements made above are correct and complete.

Joe D Fugate Sr., CEO and Publisher

Model Railroad Hobbyist Magazine

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[1] Per the Alliance for Audited Media and the Interactive Advertising Bureau (IAB), a totally digital publication such as Model Railroad Hobbyist must measure "circulation" by tracking readers per publishing cycle (monthly in the case of MRH) since there is no fixed physical publication to count. The audience statistics reported here follow the IAB guidelines set forth in the document published by the AAA and endorsed by the IAB/IAB: http://www.iab.net/media/file/Mobile_Audience_Measurement_Guidelines.pdf

[2] Unaudited and provided for Google Analytics tools can be independently verified by Google as correct and complete.

May 2014 MRH Ratings

The five top-rated articles in the May 2014 issue of MRH are:

- **4.7** DCC Impulses: Programming track tricks
- **4.7** Tom Johnson's Logansport & Indiana Northern
- **4.5** Build a detector for $10
- **4.4** Tool shed: Nibblers
- **4.4** Yes, it's a model
- Issue overall: **4.6**

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73,333 total monthly unique users (circulation);
28,605 subscribers

By these counts, MRH has 30% more subscribers than RMC and 78% more readers.

The subscriber number is a hard number – we count subscriber emails to get the number of subscribers. However, the unique users number (our "circulation") is a computed number derived using the IAB guidelines. The Interactive Advertising Bureau (IAB) is an official organization that defines the standards for how eZines measure their audience reach.

This all gets rather technical because we use Google Analytics to get help derive these visitor numbers. Google Analytics for the January issue of MRH shows that we had 111,111 unique device

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visits, but this number does not equate to unique viewers. People may use more than one device to view the MRH website or to view our magazine. So we need to "de-dupe" Google's visitors number.

(If you're interested, here's a discussion of how unique Google's unique visitors number really is.)

Per the analysis at the link above, they find the true unique users number is typically somewhere between 61% and 75% of Google's unique visitors number. In our case, based on our 2013 reader survey and how many said they read MRH with more than one device, we use 66% as the factor we apply against Google's monthly unique visits for the MRH website.

Doing the math gives us:

111,111 x 66% = 73,333

Per the analysis at the link above, our unique monthly visitors number could vary between 67,000 and 83,000. We feel pretty safe going with 73,000 since it's on the lower end of the middle and it comes from our recent reader survey. It's worth noting that any of these numbers are larger than RMC's reported 41,000 circulation, which is the whole point of this discussion.

There is more ...

There are a number of other measures we can use to demonstrate MRH's web audience reach versus that of RMC. All of these measures show MRH has the greater reach, lending credence to our claim that MRH has now become the number two general model railroading publication in the hobby, surpassing RMC.

Using stats from the web traffic tracker site, similarweb.com, we find the following monthly website visits:

Model Railroad Hobbyist (model-railroad-hobbyist.com)
110,000 visits

Railroad Model Craftsman (rrmodelcraftsman.com)
20,000 visits

If we look on the number one website in the world, Facebook, we see as of this writing:

Model Railroad Hobbyist on Facebook
6748 likes

Railroad Model Craftsman on Facebook
5959 likes

If we check the number three website in the world, YouTube, (Google is the number two website after Facebook), we find only MRH and *Model Railrouder* have official pages there, while *Railroad Model Craftsman* has no official YouTube page.

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If you look at which of the major model railroading publishers have an official web video channel, only MRH (TrainMasters TV) and MR (MR Video Plus) have such channels. RMC has none.

By every measure listed here, MRH has passed up RMC and is clearly now the number two general model railroading publication in the hobby.

Reading MRH on a $139 tablet

One of the least expensive tablets you can buy is the 7" Amazon Kindle Fire HD for $139. The display on this little guy is 215 dpi, and the size is 1280x800.

We wanted to see how well this inexpensive Kindle would work for reading MRH, so we got one and put it through its paces. The conclusion? This is one sweet way to read MRH.

Just think, with this guy you can read MRH in your easy chair, read it in bed, read it in

the "throne room," take it into the layout room or take it to your workbench, and you can also bring MRH with you on the go.

The $139 version has 8 GB of memory and includes wi-fi, so if you are near a wi-fi hotspot, you can click the comment or ad links on an issue and go to the page on the web. That 8 GB will hold over 100 issues of the MRH Standard Edition, so you can take your entire MRH collection with you!

MRH on Amazon's new 7" Kindle Fire HD, price: $139.

We've found the best app to use for reading MRH on an Android tablet like the Kindle Fire is ezPDF Reader PRO (see the icon at the right). This app costs $4 to download, and it does a very nice job displaying the MRH Standard Edition PDF. All the links are clickable, and the Portrait format of MRH is very readable.

You can pinch-zoom on the images and you can watch the linked videos and click-n-spins on the Kindle Fire HD tablet.

We find downloading the Portrait version to be as easy as opening up a browser session on the MRH website, clicking the green *Other copy options* button for the portrait version, and clicking the link for the Standard Edition. It will tell you it's

downloading the issue and in a few moments (depending on the speed of your wi-fi connection) the issue will be on your device. Look in the All PDFs area of ezPDF Reader to find it.

We feel reading MRH on a tablet takes it to a whole new level as compared to reading MRH on a computer. It's way more convenient than using a laptop – and at $139, it's a whole lot cheaper.

Did we mention that TrainMasters TV videos (using the alternate player) also play nicely on the Kindle Fire HD?

TMTV: New module-building series coming

Speaking of TrainMasters TV, a new how-to series is coming to TMTV. Trevor Marshall of Model Rail Radio is working with us to do a series on building Free-Mo modules in S scale.

We like S scale because it's large to show up well on your video screen, and the techniques will apply to other scales as well. (Plus, S scale is just a darn nice size to build in, regardless).

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If you'd like to know more, or if you'd like to talk with Trevor about the series, see this thread on the MRH website: mrh-mag.com/node/18021 —

We are running a TrainMasters TV survey with MRH readers. We're looking to see what extra-value video we could bring to TMTV for you. This survey is your chance to tell us what would be of the greatest value to you.

TrainMasters TV's motto is "helping you become a better modeler, one video at a time." As we do the hobby, we all hit roadblocks and things we'd like some good solutions too. If you have some things you'd really like to see demonstrated for you on video, let us know and we'll see if we can pull something together.

Remember to take the TMTV survey!

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Submitting an article? Remember the bio!

We get a lot of article submissions that fail to include an author bio, so we're reminding you budding authors here to remember to tell us about yourself!

We like to get a "mug shot" of you, ideally in a model railroad setting, but even standing in front of a blank white wall will do.

Also give us a few paragraphs about yourself: first, tell us how you got into the hobby, then tell us about your current hobby pursuits and passion. Finish up with a little about your family, what you do for a living, and what other interests you may also have.

We cover all this in our author submission guidelines (model-railroad-hobbyist.com/submission-guidelines). Please read and follow these guidelines – it makes your submission feel a lot more professional, and by following these guidelines, you make our job of converting your article into its final published form a lot easier.

Ops Live 5 & 6 videos coming this summer

This summer, we're coming out with Ops Live volumes 5 and 6, this time on Mike Confalone's Allagash. We've completed the 4-volume eBooks series on Mike's layout, and now we're completing our 2024 "Allagash Bash" by coming out with two Ops Live videos on Mike's railroad. Volume 5 covers general operations on the Allagash, and volume 6 focuses on operations in New Sharon yard. You don't want to miss these new additions to the Ops Live series!

This Issue

John Golden has done a fabulous job in this issue's cover story describing how to build some nice models of the Seaboard B-8 and B-9 boxcars. Even if you aren't building these specific models,

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you'll want to peruse John's article for some great techniques you can use on any rolling stock model project.

We also present some nice how-to tips on steam-era freight car weathering from Charlie Duckworth, and if you ever wanted a fast and easy way to make a lot of dandy-looking deciduous trees quickly, you'll want to see Randy McKenzie's Fast and Easy Trees article. Rob Bennett shares how to use Vallejo earth texture to get a very believable textured industry roof in short order.

We're publishing the first place winner of our $500 Layout Design Contest this month: Eugene Griffin's present-day era HO layout design, getting you off to a great start for just $500!

Because Bruce Petrarca is taking a vacation this month (he's traveling abroad for fun), we're running a couple of electronic circuit articles for you.

First we have Dave Bodnar helping you discover the possibilities of remote control using the simple PICAXE kits aimed at helping high-schoolers learn modern electronics. Then the MRH staff takes a look at RR-Cirkits great new highly affordable signaling circuit boards.

This leaves our regular columns in this issue. First is Getting Real, where Marty McGuirk gets brave and completely destroys and rebuilds the Williams Creek bridge scene on his HO SNE layout.

Larry Smith, our branchline and narrow gauge guy, starts a build of a coal tipple, and Ken Patterson looks at some awesome weathering decals by Joe Stalmann.

Finally, Publisher Joe Fugate provides both the editorial on setting your layout era, and some contrary thoughts about a model railroad that feels like the real thing, in Reverse Running.

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◆ back to previous page of text ...

Bringing up the rear is Derailments, this time featuring a railroad-themed music video that's a little tongue-in-cheek, but has a good message.

Enjoy June's MRH! If any of you are going to the PNR convention in Tacoma in June, make sure and say hello! ☒

Reader Feedback
click here!

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You can find the latest catalog on our website in PDF form at: https://www.atlasrr.com/catalog.html

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PART 2 - ORDER

Now that you've previewed in detail what Atlas has planned for you, the key to ordering products is the 'All Scales Monthly Catalog' (ASMC).

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Another look at trees: Part 1

Trees in our cultural gardens are valued and beloved, but also get a sense of age and permanence. Trees are such a common part of the world's landscapes that we often judge the scale of objects in relation to the trees. They are iconic. For these reasons, as well as other aesthetic and practical reasons, I believe our choice of trees for the cultural garden deserves a little good luck.

In this article, and those to the next issue, I'll share a variety of trees that have shown their potential in the cultural garden or are likely candidates as the new 175 begin with a leaf flower or as the fully mature. (Deciduous trees typically have their autumn appeal—they provide a full-bloom appearance in each season of the year. There is always something to appreciate, from spring leaf bud and early flowers, to summer dense canopy growth, to fall colors and leaf drop, to winter's unclothed branch display.

Hypothetical

Last November I visited the garden with what is considered numbers in Autumn Hyacinthus. Most of the plants had been evergreen or deciduous trees with the exception of one shrub that was in their usual consensus and display.

2. The dwarf crape myrtle has many other and human with, including its stunning branch patterns and the small, white berries that remain into winter. (Photo taken in Longwood Gardens.)

1. The tree showing a good crop of red berries is a dwarf hawthorn, photographed in mid-November. It is usually a multistemmed tree but can be trained to a single trunk. (Photo taken in Longwood Gardens, Kennett Square, Pennsylvania.)

3. This Washington hawthorn, grown as an outdoor bonsai, was 10 years old in this photo. (Photo taken in Longwood Gardens.)

1 This 15-year-old upright cryptomeria japonica 'Jindai-sugi' grows in the author's back **A** Yuka Hattrup

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Queensland cattle wagon new from Walsker Models

Deutsche Bundesbahn DR660 van coming by Hobbytrain

'Puffing Billy' NA class 2-6-2T news from Hasbell

Add-ons for your locomotives

Add-ons, from left to right: Three-piston-drive valve handles, one valve steam drill lubricator, a threaded type valve and a cliff pipe. JONATHAN SWINDELL

Just like aftermarket accessories that can be purchased for an automobile or engine to performance, there are a number of different attachments and add-ons that can be added to live steam locomotives to enhance both their operation and overall appearance. This issue I'll take a look at a number of these useful add-ons.

An installed sight valve allows users to be added to the boiler where it is under steam pressure. This valve, developed by Derek Cundall in the United Kingdom, greatly replaces a plain screw-in filler plug on the boiler. A sight boiler with a length of plastic tubing (marked valve). The sight lets the valve to that used to pump water into boiler.

Online extras

Want to find all suppliers of all of the add-ons mentioned here at once? Head to trainsofthemonth.com/ and click on "Live issues" under "The Magazine".

The valve handles or plastic, coated knobs that supplied on gas fuel burner valves or, maintenance accessories usually look out of place and can tend to absorb. These handles can easily be replaced with valve handles that are both easier to operate and better looking. Also, both steam and gas control valve sizes can be replaced with ones that have much longer spans, which means less valve adjustments is better speed control for the throttle and more precise regulation of the gas flow.

Another useful live steam add-on valve additions a oil atomizer gas pressure cap valve. The easy to maintain, this gas tank a located close to the boiler, as the tank will get warm during the course of a run. As the gas warms, its pressure increases and so does the flow to the burner, resulting in a hotter burner and boiler. For this reason be turned down to prevent the safety valve from blowing. An pressure gas pressure regulator will help to maintain a constant gas pressure to the burner during a run, independent of the pressure in the gas tank.

Type of displacement lubricators work on the "oil on sinking" arrangement. Water has much of a percentage the lubricants (resulting in a steam engine from the cylinders) or the engine to run hot or, which could damage the cylinders. An adjustable lubricator will cure this, as it has a screw that regulates the oil flow to the steam line. These are usually supplied with piping. Synthesizing swapping it for the existing lubricators. It takes a little practice to achieve the optimal setting.

Quick valve valves supplied on many live steamers used to relieve steam from the boiler to release upon into the a pressure range. In both cases, steam is wasted. A one pop trips valve, valve will open over a shorter pressure range and will close rapidly and will shut, with no reaction "pop" if you replace the original safety valve on your locomotive, make sure that the pressure at which the new one releases is at the correct level specified by the locomotive.

A number of live live steam locomotives are not supplied with pressure gauges. A pressure gauge a probably one of the most useful areas that can be added to an engine. Fortunately, most manufacturers thoughtfully provide a space finishing on their boilers to allow pressure gauges to be added by the owner. A pressure gauge is simple and really a U-shaped piece of copper pipe (or a coil called a siphon tube) which the siphon fills with water and prevents live steam from damaging the sensitive Bourdon tube inside the gauge.

Exhaust injectors (also called chuff pipes) amplify the exhaust sounds coming from the cylinders of a locomotive. These are connected to the locomotive's stack and incorporate a mechanism that allows engine steam to be injected into the stack. The chuff pipes replace the existing straight exhaust pipe on a locomotive. An added benefit to these is that the volume is no longer required up the stack as the start of run, due to the exhaust operating being fed on the side of the locomotive chamber.

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CITY: The name Clearwater summons to mind tiny Florida city a popular spot for beachgoers, to all above. Imagine the Gulf of Mexico, clear blue water, whitesand beaches, green coconut palms. Now imagine the sound of two EMD GP40-2s rumbling toward you slowly at a busy street-level with chimes and whistle blasts and clanging bells. Then, just two minutes of driving will take you back to the beach.

TRAIN-WATCHING: CSX train [illegible] nicknamed the 'Clearwater Switcher' is the only major line operation on the Clearwater Subdivision. Both operations scheduled each weekday and with workers and railroads the town of Pinellas and Tampa, it is typically easy to find and follow on its 25-mile run.

The train goes on first at 10 p.m. at the yard office just south of the street running in Clearwater. Typical operations that it running to Tampa first to pick up cars before switching in business on the way.

The shipping starts with a mile meandering trackage on Cleveland Avenue, from Tyrone Mall to Largo. Within another couple miles are just a few miles away, in the heart of Clearwater's historic district, where the train runs down the middle of the street, with cars and pedestrians on both sides. Then, just two minutes of driving will take you back to the beach.

Another location worth exploring is the long bridges across Tampa Harbor on approach to neighboring Tampa. Numerous power, cement, and a few railroad, primarily industrial rail storage, are also to attract along the line.

RADIO FREQUENCIES: [illegible]

FOR YOUR FAMILY: While you take a few hours to follow the train on the road, the family can relax at one of many marina beaches.

Other attractions include the Cleveland Street district, home to restaurants along with shopping. The Clearwater Ferry, Clearwater's [illegible] is the spring training home of Major League Baseball's Philadelphia Phillies. Nearby St. Petersburg is home to the Dali Salvador Dali Museum, 8th is dolphin watching, golfing, and the nearby Florida Botanical Gardens. Orlando & Walt City, and your family will have plenty of activities.

TRACKSIDE GUIDE CLEARWATER, FLA.

Plasser American

The StabMaster

Maine Central 4-4-2 No. 470, on display in Waterville, Maine, for 64 years, could steam once again. [illegible]

Maine Central No. 470 may run

Nonprofit plans to restore and run historic Alco-built 4-4-2 to its home state of Maine

The locomotive that pulled Maine Central's varnish in steam excursions in 1956 could soon traverse eastern/central Maine once again. The city of Waterville, Maine, has donated 4-4-2 No. 470, a 4-4-2 built by the American Locomotive Co. in 1913, to the New England Steam Corp., a nonprofit league in 2012 with plans to restore and operate the engine.

The locomotive has been on display near the Two Cent Bridge in Waterville [illegible]

Members of the nonprofit New England Steam Corp. clean coal soot at No. 470's exhibition. The effort has to restore the engine to operation is about $1.7 million.

4-4-2 No. 470 was the last Maine Central steam locomotive to be retired from service, in 1956. After being displayed in Waterville for 64 years, the engine was rolled to its current display site in 1970, when the "bones" of the engine are still good. "It's not pristine, but it's very restorable," he says. "It's a cosmetic thing more than anything. Considering it's been outside [illegible]."

In December 2012, the Waterville city council voted to sell the engine if the group can raise $15,000 within two years, and in early 2013 the group was right on its way to that goal. The organization plans to restore the engine at Hillcrest Shops it built on a parcel on the Kennebec Valley Railroad. The group also has the support of the Maine Eastern Railroad [illegible]

[illegible] said at a ceremony. Above all," said Sims, "it is [illegible] not to be [illegible] a piece of history if [illegible] could. And I [illegible] no more to do," he [illegible] says. "I'm not the engine mechanic and [illegible] one of the 3 or 4 [illegible] to [illegible]."

[illegible] www.newenglandsteam.org

Norfolk & Western No. 611 heads to the shop

With CSX's embrace of handing a hand to rebuild former N&W Class J 4-8-4 No. 611, the Virginia Museum of Transportation plans to move the famed streamlined passenger locomotive to its North Carolina restoration facility in May. No. 611 (above climbing the 4.7-percent Salisbury, N.C., grade in October 2000) will move to new home Norfolk Southern's Norfolk & Western heritage yard here the Roanoke, Va., museum's the North Carolina Transportation Museum on the 2000 steam locomotive can appear at the Spencer, N.C., museum's Smokestack of Spencer turntable with classic 1950s and 60s cab ends. May 29 (see 1. Restoration will take place inside the Spencer roundhouse and is expected to take about nine months. Meanwhile, the Virginia museum will prepare a permanent home for the locomotive at its site in the former N&W Roanoke freight house.

Class J's builder, Roanoke, Va.-based Norfolk & Western, had locomotives in their earlier numbers and liveries. At the railroad's start in the 1870s, it manufactured locomotives into its own system with No. 1 becoming No. 600. Renbers built No. 1 in 1907 for customers Tennessee Coal as its No. 70. It was sold to Virginia Ashland Railroad in 1950. The engine gained more fame with a role in the epic Western "How The West Was Won" in 1962 (pictured as "Virginia & the Grande" No. 1. Shown on the Wagon Artzona scenes with August 1962 since Hollywood already took over, although modern filming on the railroad brought steam back as late as 1971. No. 1 had made its last trip in June 1957 and was eventually sold to the Texas railroad.

Steam Team Patriots has reassembled Wagon Wheels 4-8-2 No. 7 and plans to restore it to identity as No. 1 when it operated on the southwestern short line. Steve Lee Parks acquired the railroad. General Manager Earl Knode decided to return all steam

ASK TRAINS

>> This Month:
- Early ABS signals
- Erskine Central returns unlikely
- Loose spikes not a hazard

The 1907 photo of the High Bridge station used by the Cincinnati Southern Railway's High Bridge & Kentucky also shows an early automatic block signal. LIBRARY OF CONGRESS

Q While surfing the Web, I found an old image of the High Bridge in Kentucky. In the picture, there is an unusual sign that can be seen on each side of the bridge. Can anyone tell me what it means? It was also visible in a separate image of a tunnel. — Larry Brough, Newark, Ohio

A The "cigar" isn't a cigar at all, but an automatic block signal. Also called semaphore block signal, this signal was produced by the Hall Signal Co., one of the earliest manufacturers of railway signals in the United States. A popular kind for this device was the "Hall's Signal." Signals were usually positioned to give an engineer a visual warning to prepare to stop a train at the next block. In this case, the signal was approximately a quarter mile (.4 kilometer) beyond the bridge on the Cincinnati Southern's Kentucky subdivision at that time.

At the time of the photo, trains on the Cincinnati Southern ran single track, but protected by the block signaling. The primary purpose of the system was to help engineers maintain the distance of trains running one right after the other. The railroad was dispatched by timetable and train order, however, with a number of signal and interlocking plants along the route. The semaphore in the foreground of the photo appears to be wire connected to the nearby switch, which could indicate a cross that you see of the switch. It appears the engineer on High Bridge could hold the switch open, a train could enter and then the switch would be closed behind the train. Then the signal would clear for the next train to enter the bridge.

The train in the distance on the left side of the bridge is moving south. The signal at which it is about to pass appears to be a dwarf signal. Dwarf signals are not governed by the block system. The right signal governs southbound trains, and the left governs northbound trains. These signals control only the movement of trains into the bridge. The signal on the right side of the bridge is governing the movement of the train in the distance. The train is moving south and is about to pass the dwarf signal.

The semaphore on the Cincinnati Southern is no longer there. The line was sold to the Kentucky & Tennessee Railroad in 1990. Norfolk Southern now operates the line. The K&T operates approximately 338 miles (544 kilometers) between Somerset, Ky., and Oak Ridge, Tenn. Norfolk Southern operates the remainder of the former Cincinnati Southern line.

Q Each year, some railroads hold an open house so employees' families can see where their loved ones work. Do railroads ever invite the general public to visit their facilities? — Jim Kaufman, Lancaster, Pa.

A Not in the sense that you mean. Railroads are private property, and they don't want people wandering around their facilities. Many railroads do, however, have special events for employees' families, and some railroads have special events for the general public. Some railroads have special events for employees' families, and some railroads have special events for the general public. Some railroads have special events for employees' families, and some railroads have special events for the general public.

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Kalmbach

Q On a recent visit to Montana I saw what appeared to be the remnants of a railroad line from Livingston, Mont., near Yellowstone National Park. Was there once a rail line there? — Edmund Ashton, Tacoma, Australia

A The remnants were from a Northern Pacific branchline that went 13 miles from Livingston to the Northern Gateway of Yellowstone National Park at Gardiner, Mont. Known as the Park Branch, the Burlington Northern had abandoned all but a 1.1-mile stretch north of the depot in Livingston by 1991. Montana Rail Link now has leased an area of land from the BNSF. — Rob Dickenson

Q What is the typical width of a railroad right-of-way? — Dominic Hennessey, Glasgow, Mont.

A Historically, rights-of-way ranged far beyond the surface width of the centerline of the main track. Any rights were shrunk in all the rail [illegible] in congested areas and by single or railroad, some sharply in cases [illegible] Chicago, or where there are several tracks. — Michael W. Blaszak

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Reverse Running: Stepping outside the box with a contrary view

by Joe Fugate

I love this photo of Brian Bennett from one of Mike Confalone's operating sessions. To me, this photo speaks to the fantastic job Mike Confalone has done creating a model railroad in miniature that feels like it's a real railroad.

Not everyone is into prototype or proto-freelance modeling operations. I recall the janitor at my high school liked model railroading, and so did I. The janitor didn't care one iota about ops, but did he love building models! We had a great time talking trains, leaving many fond memories.

But for me, it's the operations side that excites me the most about the hobby. The model building, the wiring, the benchwork and trackwork – that's all a means to get to the part I love the best: running the trains realistically.

When I think back to what fascinates me most about trains, it's the noisy, gritty, big machines hauling tonnage.

MMH has been doing what we call our "Allagash Bash" with the two-part railfan trip in January/February, and the new eBook series since January – not because we think modeling 1980s Maine in April is cool. No, we think Mike Confalone has captured the essence of really railroading with his models in a way that more modelers need to learn about.

As part of gathering content for the Allagash Bash, I attended one of Mike's operating sessions in July of 2013. I must confess, I was impressed – and as one who has seen hundreds of model railroads now, it's not easy to impress me at the "that's amazing" level, but Mike's HO Allagash managed to do that for me.

First, Mike has executed his layout scenery and photo backdrops with finesse. The scenery-to-track ratio often favors the scenery, further driving home the rural setting.

Second, there were no derailments I can recall during the entire op session. That is rare. It takes good equipment and trackwork to pull that off, as well as an experienced crew that's not making a lot of mistakes like running turnouts thrown against them.

Thirdly, Mike overweights his rolling stock by roughly double the NMRA weight standard. As a result, all the trains on the Allagash feel more massive, the cars don't "wobble" and everything stays on the track better. The trains feel more like "tonnage" when they roll by because they actually do have more mass.

Finally, every loco on Mike's layout has sound. All too often sound can become annoying, but Mike's got it just right. Mike turns the volume down so you can't hear locos from across the room – the sound isn't blaring. You need to be close to the loco to really hear it well.

The total effect of all this makes the Allagash feel different than many model railroads. It seems like you are looking at a scaled-down version of a real railroad rather than just some plastic toys. You get pulled into the action like few model railroads I've seen; you feel as if you're really railroading, with those big gritty, noisy machines pulling some serious tonnage! ☒

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Chicago sprawl

High above the cars, taxis, and people rushing to and fro 95th Tower, a Chicago Transit Authority train rumbles overhead near the corner of Jackson Boulevard and Wells Street in downtown Chicago on July 18, 2013. CTA's Brown, Red, Orange, and Purple lines run here. — Photo by Steven Chea

Straight up

This pool hall in Aztec, N. reportedly built in the 1880s, has seen its share of trials over the years, whether they were those of the Chicago, Burlington & Quincy or today's BNSF Railway. On Sept. 7, 2013, a customer, R. Howell looks over those Pacific years to reflected in the window of the venerable gaming establishment. — Photo by Roger A. Howell

Ah, the beauty of the Northwest

[illegible] Jim Hill Co. [illegible] used his office [illegible] Flying Pride Wins, Mont. Roberts Road. B.C. [illegible] export coal train through the mountains and [illegible] River Gorge on a journey through [illegible] Mt. Coast of Coast, Wash., on Nov. 29, 2012. The route [illegible] and those of the former Northern Pacific & Great [illegible] Photo by Chris Wichman

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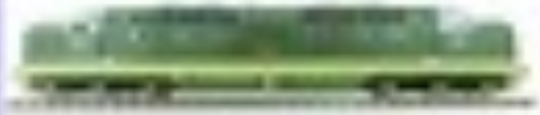

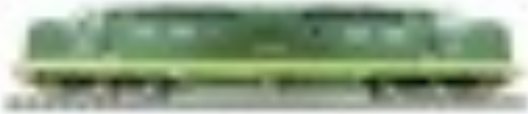

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SEABOARD COAST LINE

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Text by Rockwell Potts

NH *Keystone State*

Following the end of World War II, the railroad refurbished many passenger trains in an attempt to retain its passenger business. Even the prestigious Manhattan Limited, New York, New Haven, & Hartford Railroad bought new streamlined cars for its long-distance trains, thus the railroad operated in conjunction with rivals New England Lines. Ordered in March, 1947, Pullman-Standard built four special, six-double bedroom/buffet/lounge cars in Wisconsin. Nicknamed-plans, Delivered in January 1949, Pullman-operated the *State* series cars make a connection with the New Haven Railroad. The cars were intended to replace former heavyweight equipment on the New Haven Railroad. The cars were assigned to the Montreal and Maine routes to the eastern coastal end to the Boston–Washington federal.

The *State* series were the last sleeping cars purchased by the New Haven Railroad. Pullman designed the cars with a bedroom-A-B-C-D-E would be F—cable-joined ... the only cars with duplex-single layout. The cars also had a double and a single car with 24 seats designed to serve a buffet-lounge breakfast. The kitchens had air-cooled ovens and were like small dining car kitchens where chefs could cook broiled steaks, fish, and hamburger. Delivering food triangular tables and seating against the wall as well as the traditional table seating with passengers facing each other. The food and beverage service in the *State* series dining cars were also operated by Pullman-Company employees. Once cars had arrived stainless steel tables with the New Haven monogram on the styled the car. The cars numbers were the same as:

Name	1951	PC	Amtrak
Big State	3501	4404	4351
Keystone State	3502	4405	4352
Nutmeg State	3503	4406	4353
Blue Hen State	3504	4407	4354

After the fleet of Master cars disappeared in 1961, the Nutmeg State and Blue Hen State were used on the Merchants and Bicentennials, replacing the Clipper series cars. With the ending of the Merchants in 1968, Penn Central used the *State* series on its various routes, including the Broadway Limited, and for the winter of 1968, the Long Island Railroad leased the Nutmeg State and Blue Hen State for parlor car service on the railroad's Atlantic Coastal Rail to replace parlor cars that had been scrapped.

When Amtrak began operations for intercity passenger trains in 1971, the *State* series cars were overweight for they were used on Florida trains, Amtrak used the Keystone State on routes out Chicago for a few years. The Nutmeg State and Blue Hen State were retired in July 1971, followed by the Keystone State and Big State in June 1981.

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